

Department of Cultures
University of Helsinki
Finland

DEATH IN THE STONE AGE

MAKING SENSE OF MESOLITHIC-NEOLITHIC MORTUARY REMAINS FROM FINLAND (CA. 6800 TO 2300 CAL BC)

Marja Ahola

ACADEMIC DISSERTATION

To be presented, with the permission of the Faculty of Arts of
the University of Helsinki, for public examination in lecture room PIII,
Porthania, on 18 October 2019, at 12 noon.

Helsinki 2019

Supervisors

Doc. Antti Lahelma
Department of Cultures
University of Helsinki

Prof. Mika Lavento
Department of Cultures
University of Helsinki

Doc. Kristiina Mannermaa
Department of Cultures
University of Helsinki

Reviewers

PhD Liv Nilsson Stutz
Department of Cultural Sciences
Linnaeus University, Sweden

Prof. Aivar Kriiska
Institute of History and Archaeology
University of Tartu, Estonia

Opponent

PhD Liv Nilsson Stutz
Department of Cultural Sciences
Linnaeus University, Sweden

- © Marja Ahola (Summary paper)
- © The Finnish Death Studies Association (Paper I)
- © The Archaeological Society of Finland (Paper II)
- © Cambridge University Press (Paper III)
- © John Wiley & Sons Ltd (Paper IV)
- © The Royal Swedish Academy of Letters, History and Antiquities (Paper V)

ISBN 978-951-51-5300-5 (pbk.)
ISBN 978-951-51-5301-2 (PDF)
<http://ethesis.helsinki.fi>

Unigrafia
Helsinki 2019

ABSTRACT

This study aims to understand and explain prehistoric funerary practices from the perspective of Finnish Stone Age hunter-gatherer and early pastoralist earth graves located in mainland Finland. These structures date primarily from the Late Mesolithic to the end of the Middle Neolithic (ca. 6800–2300 cal BC) and represent a unique challenge to archaeological research. This is because unburnt bone material — including human remains — along with other perishable materials are generally not preserved in the acidic soils of Finland. Accordingly, the only feature that marks a Stone Age earth grave is the presence of ochre or stained soil, sometimes together with grave goods typical for that period.

This thesis presents a compilation of material remains and archival information from Stone Age earth grave sites and research material as a whole. This approach aims to demonstrate that, whilst Finnish Stone Age earth graves primarily lack human remains and other perishable materials, we can still gain important new insights into Stone Age funerary practices. Consequently, the objective of this thesis lies in systematically studying the earth grave materials, attempting to understand the rituals behind them, and using these data to interpret mortuary practices and cosmology.

Based on the results described and discussed in this thesis, the Stone Age mortuary tradition in the Finnish territory represents a complex set of practices that includes not only the archaeologically visible earth grave tradition, but also other means of ritually disposing of the dead body. Accordingly, when we refer to Stone Age mortuary practices in the Finnish territory, we are not speaking of ‘inhumations in simple pit graves’, but of the material remains of complicated rituals that give meaning to and place death within the cosmology of those people. Indeed, the systematic archaeological research conducted in this thesis revealed that both adults and subadults were given earth graves, a tradition also known from better-preserved Stone Age cemeteries in nearby regions of Finland. Similarly, Stone Age people used — and did not use — certain artefacts or raw materials in their funerary practice, in clearly ritualised ways and, for example, to emphasise the identity of the community.

When comparing the data in this thesis to other ritual practices known from that specific period and region, Finnish Stone Age earth graves seem to encode an animistic–shamanistic cosmology. Indeed, similar to, for example, prehistoric rock art sites, the Stone Age hunter-gatherer cemeteries are also situated next to topographic features possibly connected to supernatural powers, whilst the graves themselves were furnished with objects that might have been considered living. Simultaneously, an intentional connection to past generations was also sought by positioning new burials amongst older ones or by reusing old cemeteries. To conclude, even if the Finnish Stone Age earth graves

primarily lack human remains and other perishable materials, the graves are not as poorly preserved as one might assume. On the contrary, when the earth grave material was investigated as a whole and subjected both to new analyses and theoretical understanding, we gain important new insights into Stone Age mortuary practices and cosmology.

PREFACE

My journey with prehistoric burials and mortuary practices began in Cambridge in 2005, when I found a copy of Mike Parker Pearson's *The Archaeology of Death and Burial* in a local bookstore. I spent several hours afterwards in a dim corner of that bookstore reading his book from cover to cover. That same book now sits on my desk; when I glimpse its cover, I recall my delight at finding it. That book not only led me towards mortuary archaeology, but also offered a theoretical framework that has guided me from my Master's thesis, dealing already with Finnish Stone Age graves, to this dissertation.

This dissertation picks up where my Master's thesis left off. In doing so, it aims to provide an overview of Finnish Stone Age earth graves and to make sense of mortuary practices and cosmology during that era. Although organic components remain largely missing, the material has proved sufficiently intriguing to maintain my intellectual interest throughout the last decade and a half. I can even say that these burials have haunted me from the very beginning of this journey.

However, despite travelling this path for more than a decade, I did not understand the meaning of death until I lost a loved one. Living through death and burial in a contemporary society, however, puzzled me. In our world, death is handled by outsiders—nurses, morticians, and priests—and we, heartbroken in our loss, remain outside the process of burial. When my loved one died, I felt as if the only thing I was allowed to participate in was the long, liminal weeks following the moment of death until the burial. Perhaps I could have participated more, but no one told me how. In our society, knowledge of death remains the possession of a few and is no longer openly shared.

This experience left me thinking about my thesis. According to Stone Age hunter-gatherer burial material from Finland and abroad, the dead were not merely cared for, but an intentional connection was sought by placing new burials amongst those older. Whilst in this thesis I used this material to interpret the cosmology of Stone Age people, it seems evident that these meaningful rituals also helped individuals then to overcome the loss of their loved one. However, as I coped with death in my own life, I did not participate in handling the body or in preparing my loved one for burial. Furthermore, since I am not a member of a Lutheran congregation, the funerary ceremony did not place that death within my cosmology either. Thus, I lacked meaningful death rituals altogether.

I am not alone in my thoughts. In fact, similar experiences gave rise to a death-positive movement that encourages people to speak openly about death, dying, and corpses. Simultaneously, attention has focused on the role of death rituals—both sacred and secular—and to the ways in which these ritual practices assist us in coping with death. Through this thesis, I hope to contribute

to this discussion by offering insights into ancient funerary practices that nevertheless echo our modern-day concept of burying the dead. I even dare to suggest that, alongside the knowledge gained from prehistoric graves and burials, the social significance of the archaeology of death and burial might lie in its creativity in allowing us to find meaningful responses to contemporary death.

ACKNOWLEDGEMENTS

Numerous people have contributed to this thesis by offering support, insights or materials. To begin with, I would like to offer my sincere gratitude to my supervisors Antti Lahelma, Mika Lavento and Kristiina Mannermaa for all the time and effort they have invested to me – this thesis would not have been written without you! Thank you Mika and Antti for always being there for my questions, big and small, and for believing in this topic from the very beginning. A special thanks goes to Kristiina who took me under her wing (pun intended!) and mentored me from my first conference presentation to our co-authored papers and research collaboration – thank you for all of our adventures!

I would also like to thank the pre-examiners of this thesis, Professor Aivar Kriiska and PhD Liv Nilsson Stutz (who also acted as the opponent of this thesis) for their insightful comments and suggestions for future research. I would furthermore like to offer my greatest gratitude to my co-authors Kati Salo, Kristiina Mannermaa, Tuija Kirkinen, Krista Vajanto and Janne Ruokolainen for wonderful collaboration.

I would also like to express my gratitude for Torsten Edgren and Mirja Miettinen for reciting their excavation experiences to me. I am especially grateful for Torsten for inviting me to his home and sharing his experiences, photographs and field notes with me. These materials and discussions have been invaluable for this thesis.

Milton Núñez is to be thanked for all the support and comments he has offered me during these years. It seems that getting lost in Turku can be the start of a wonderful friendship! In regard of friendship, I would also like to thank my co-doctoral students in UH archaeology – Santeri Vanhanen, Marko Marila, Jarkko Saipio, Tuuli Heinonen and Frida Ehrnsten – for our numerous discussions over lunch and coffee breaks. It has been great to be on this journey with you!

I have also received invaluable support from all my friends and colleagues in archaeology at the universities of Helsinki, Turku and Oulu and in all other institutes as well. Thank you Wesa Perttola, Satu Koivisto, Teija Alenius, Georg Haggrén, Teemu Mökkönen, Mikael A. Manninen, Elisabeth Holmqvist-Sipilä, Jan Fast, Tiina Äikäs, Ulla Moilanen, Kalle Virtanen, Pirjo Hamari, Anna Wessman, Kristin Ilves, Vesa-Pekka Herva, Maria Lahtinen-Kaislaniemi, Liisa Kunnas-Pusa, Petro Pesonen, Suvi Tuominen, Andreas Koivisto, Suzie Thomas, Rick Bonnie and all the other wonderful people I have met during these past four years or so. A special thanks goes to my new team – Volker Heyd, Bianca Preda-Bălănică and Kerkko Nordqvist. I am grateful for all your help in the final steps of this project and looking forward on our future adventures!

I would also like to thank my friends in Religion studies – Maija Butters and Terhi Utriainen – for the intriguing discussions on death and death rituals, old and new. For similar inspiring discussions, I would like to thank the MesoBurial Working Group – Aija Macāne, Mari Tõrv, Sara Gummesson, Rita Peyroteo Stjerna, Almut Schülke, and of course, Kristiina Mannermaa and Liv Nilsson Stutz. I hope that we will eventually be able to meet up again... Åsa M. Larsson and Judith M. Grünberg are also to be thanked for offering support and insightful comments during the course of this project while a special thanks goes also to Ekaterina Kashina for our friendship and collaboration.

I appreciate the financial support from Nordenskiöld-samfundet i Finland r.f. and the Doctoral Programme in History and Cultural Heritage at the University of Helsinki. Special recognition goes to Professor Kirsi Saarikangas who enabled my research by taking care of all the practical matters of my salaried position.

Finally, I express my deepest and most sincere gratitude to my family and friends for their endless support: to my parents who always encouraged me to follow my dreams and to my big brothers, their families, my parents-in-law and my own children for living through this project with me. I would also like to thank my old friends Niki Bergman and Katri Lassila – Niki for all the Swedish translations and Katri for photographs and artwork. You are the best! Last but not least, I would like to thank my husband Matti who has not only encouraged me to this path but also supported me on every step – this book would not exist without you!

Helsinki August 2019,

Marja Ahola

CONTENTS

Abstract.....	3
Preface	5
Aknowledgements	7
Contents.....	9
List of original publications	12
Abbreviations	13
1 INTRODUCTION	14
1.1 Background of the dissertation	14
1.2 Previous research.....	19
1.3 Objectives and scope of the dissertation	22
1.3.1 Research theme 1: Generating detailed information about Finnish Stone Age earth graves.....	22
1.3.2 Research theme 2: Stone Age mortuary practices within Finnish territory	23
1.3.3 Research theme 3: Stone Age cosmology given the mortuary material.....	24
2 THEORETICAL BACKGROUND	26
2.1 Mortuary archaeology and the rituals of death.....	26
2.2 Stone Age mortuary archaeology in northern Europe	28
2.3 From graves to cosmology and belief systems	31
2.3.1 Animistic–shamanistic cosmology	32
2.3.2 Social memory and previous generations	34
3 RESEARCH MATERIALS AND METHODS.....	36
3.1 Archival material.....	36
3.1.1 Excavation reports	36
3.1.2 Photographs and drawings	37

3.1.3	Site plans and maps	37
3.2	Find material.....	37
3.2.1	Human remains	38
3.2.2	Artefacts and other finds.....	38
3.2.3	Soil samples.....	38
4	RESULTS AND DISCUSSION.....	39
4.1	From fragments to a more complete picture of Finnish Stone Age earth graves	39
4.1.1	Earth graves in numbers.....	39
4.1.2	Dating the graves	41
4.1.3	Grave structures	43
4.1.4	Individuals buried given the sparse human remains	49
4.1.5	The material culture of death: clear patterns observed	52
4.2	Stone Age mortuary practices within Finnish territory	57
4.2.1	Hunter-gatherer mortuary practices in earth graves	57
4.2.2	Continuity and changes in hunter-gatherer earth grave mortuary practices	59
4.2.3	The multiplicity of hunter-gatherer mortuary practices	59
4.2.4	Corded Ware mortuary practices and the connection to hunter-gatherer funerary traditions.....	61
4.3	Stone Age cosmology given burial sites and mortuary practices	64
4.3.1	Connecting to previous generations	64
4.3.2	The importance of landscape: further connections to rock art.....	66
4.3.3	Grave objects: packed with meaning	67

5	CONCLUSIONS	69
	References	73
APPENDIX 1: List of Finnish Stone Age earth graves (2019)		
ORIGINAL PUBLICATION I-V		

LIST OF ORIGINAL PUBLICATIONS

This thesis is based on the following publications:

I Ahola, Marja (2015). Tracing Neolithic Funerary Practices from Finnish Ochre Graves – A Case Study from Kukkarikoski Comb Ware Burial Ground. In Honkasalo, M-L, Koski, K. & Kanerva, K. (eds.), *Theme issue: Images of Afterlife*. *Thanatos* vol 4, 2/2015: 23–41.

II Ahola, Marja, Salo, Kati & Mannermaa, Kristiina (2016). Almost Gone: Human Skeletal Material from Finnish Stone Age Earth Graves. *Fennoscandia Archaeologica* XXXIII. 95–122.

III Ahola, Marja, Kirkinen, Tuija, Vajanto, Krista & Ruokolainen, Janne (2018). On the scent of an animal skin: new evidence on Corded Ware mortuary practices in Northern Europe. *Antiquity* Vol 92, Issue 361, 118–131.

IV Ahola, Marja (2017). Memory, Landscape & Mortuary Practice: understanding recurrent ritual activity at the Jönsas Stone Age cemetery in southern Finland. *Acta Archaeologica* 88/1. 95–120.

V Ahola, Marja (2017). The material culture of Finnish Stone Age hunter-gatherer burials. *Fornvännen* 4/2017. 201–215.

The publications are referred to in the text by their roman numerals.

The author's contribution to publications II and III:

II KM initiated the study, MA collected the data and KS analysed the material. MA wrote the paper with contributions from KM and KS. The revision of the final draft was done by all writers.

III MA initiated and TK, MA and KV designed the study together. TK analyzed the animal hair material together with KV. MA wrote the paper with contributions from TK, KV & JR. The revision of the final draft was done by all writers.

ABBREVIATIONS

etc.	et cetera
e.g.	exempli gratia
aDNA	Ancient DNA
AMS	Accelerator Mass Spectrometry
BC	Before Christ
BP	Before present
cal	Calibrated radiocarbon age (in calendar years)
CWC	Corded Ware Culture
FIN	In Finnish language
GIS	Geographic Information System
n	Total number
NM	Finnish National Heritage Agency find catalogue
SEM	Scanning electronic microscope
TCW	Typical Comb Ware

1 INTRODUCTION

1.1 BACKGROUND OF THE DISSERTATION

Prehistoric graves and human remains have been a central part of archaeological research for centuries. Whereas early antiquarians were intrigued by grave objects discovered from prehistoric gravesites, contemporary archaeologists often rely on scientific methods to gain information on, for example, the health, diet, gender or origins of buried individuals. However, when dealing with graves and burial sites, we deal not only with the everyday life of the prehistoric people, but, rather, the material remains of a ritualised response to death — one of the most powerful experiences humans encounter. In comparison to, for example, death studies, archaeological research does not study the experience of dying, and instead focuses on the end product — that is, the burial (Robb 2014). This, however, leads us to another important notion: it is not the dead that bury themselves, but those within the society who continue to live. As Parker Pearson (1999, p. 3) encapsulated:

The dead do not bury themselves but are treated and disposed of by the living. Archaeologists seek not only to document ancient rituals by recovering the evidence of past funerary practices but also attempt to understand them within their historical contexts and to explain why they were enacted in the ways that they were.

This thesis aims to understand and explain prehistoric funerary practices from the perspective of Finnish Stone Age earth graves¹ located in mainland Finland. These structures date primarily from the Late Mesolithic to the end of the Middle Neolithic (ca. 6800–2300 cal BC)² and represent a unique challenge for archaeological research, given the reliance on unburnt bone material — including human remains — along with other perishable materials generally not preserved in the acidic soils of Finland. Accordingly, the only feature that marks a Stone Age earth grave is the presence of ochre or stained soil, sometimes together with grave goods typical for the period.

In this thesis, I refer to the burial structures as ‘earth graves’, since sporadic cremation also exists within the material (see Appendix 1: Vaateranta site).

¹ Due to the preferences of different journals, in the original papers these graves are also referred to as pit graves.

² In this thesis, I have followed the traditional periodisation used in Finland, in which the Middle Neolithic also includes the Corded Ware period, whereas the beginning of the Late Neolithic is connected to the appearance of the coastal Kiukainen culture (e.g., Carpelan 1999; see also Nordqvist and Mökkönen 2017; for calibrated dates, see Table 2). To conform with Central European tradition, in Paper III, the Corded Ware period is, however, referred to as the Late Neolithic. In the Finnish tradition, a similar periodisation is used, for example, by Haggrén et al. (2015).

However, since the term ‘earth grave’ underlines the structure of the grave rather than the way human remains were treated, it excludes the more monumental grave structures that appear in the Finnish archaeological material primarily during the latter part of the Middle Neolithic (Núñez and Okkonen 1999; see also Mökkönen 2013). Consequently, these mortuary remains are not emphasised in this thesis.



Figure 1. Grave 3 from the Vaateranta cemetery, eastern Finland. Photo: K. Katiskoski 1998, Finnish Heritage Agency.

The primary emphasis of this thesis lies on the long-lasting tradition of the ochre earth grave (in Finnish, *punamultahauta*), a mortuary practice rooted in the Palaeolithic (Pettitt 2011) and known amongst Stone Age hunter-fisher-gatherer populations of the Finnish territory from at least the Late Mesolithic to the end of the Middle Neolithic (e.g., Edgren 1984, pp. 23, 48; 2007; Halinen 1999). These burials are typically found either as single burials or small cemeteries situated at contemporary dwelling sites or in close proximity to a settlement (Edgren 1984, p.48; Kukkonen et al. 1997, p. 4; Lappalainen 2007, p. 2). In general, the grave structures appear as pit-shaped features of loose, stained soil (Fig. 1), possibly with a greasy characteristic due to the decomposition of the body (Edgren 1966, pp. 97–106; Lehtosalo-Hilander 1973, pp. 143, 165; Lappalainen 2007). In many cases, the structure is also accompanied by an ochre feature or features of varying intensities and sizes (Lappalainen 2007, p. 3). If artefacts are present, they are typically situated at the bottom of the grave structure (Fig. 2) (e.g., Edgren 1966; 2006; 2007; Torvinen 1979; Miettinen 1992b; Halinen 1997). Occasionally, sparse human remains — primarily tooth enamel — have also been discovered in the bottom layers (Edgren 1959; Katiskoski 2003; Schultz 2006).

In neighbouring areas of Finland, similar inhumation burials dating from the seventh millennium BC to the third millennium BC have been discovered in Russia, Scandinavia and the Baltic states as solitary graves, settlement site graves and cemeteries (e.g., Gurina 1956; Larsson 1988; Zagorskis 2004 [1989]; Larsson 2009a; Kostyleva and Utkin 2010; Butrimas 2012; Brinch Petersen 2015; Tõrv 2016). In contrast to the Finnish material, however, these hunter-gatherer burials are often well-preserved, and alongside non-perishable materials also contain human remains and artefacts made of organic materials. Where these perishable materials are missing, however, the burials look very similar to the Finnish materials (Fig. 3), suggesting that the Finnish Mesolithic and Neolithic hunter-gatherer burials follow the same mortuary tradition.



Figure 2. Grave objects from grave 2 from the Kukkarkoski 1 cemetery, western Finland, *in situ* at the bottom of the grave. Photo: M. Torvinen 1975, Finnish Heritage Agency.

However, in mainland Finland, the hunter-gatherer ochre earth graves are not the only earth grave tradition present during the Stone Age. Indeed, during the latter part of the Middle Neolithic (ca. 2700/2800–2300 cal BC), people connected with the Corded Ware phenomenon (henceforth, CWC), also inhumed

their dead underground (Äyräpää 1931; Kivikoski 1934; Siiriäinen 1974; Torvinen 1979; Purhonen 1986). The CWC phenomenon represents an archaeologically defined culture that populated large areas of Europe during the third millennium BC. This phenomenon is characterised by the appearance of cord-decorated ceramic beaker vessels and shaft-hole axe heads in the archaeological evidence. Since CWC settlement sites are only rarely encountered in Continental Europe (e.g., Hecht 2007), the phenomenon has traditionally been known from its grave finds, which stand out when compared to prior mortuary traditions due to their novel funerary practices (Furholt 2014, p. 70). Although regional variation exists, these new practices generally include individual internments, positioning the body into a crouched position featuring gender differentiation based on the orientation of the body and furnishing the grave with items such as battle axes, adzes, cord-decorated beakers and amphorae also prescribed by gender and placed in relation to the body (Furholt 2014, fig 2; Larsson 2009a, pp. 60–61).

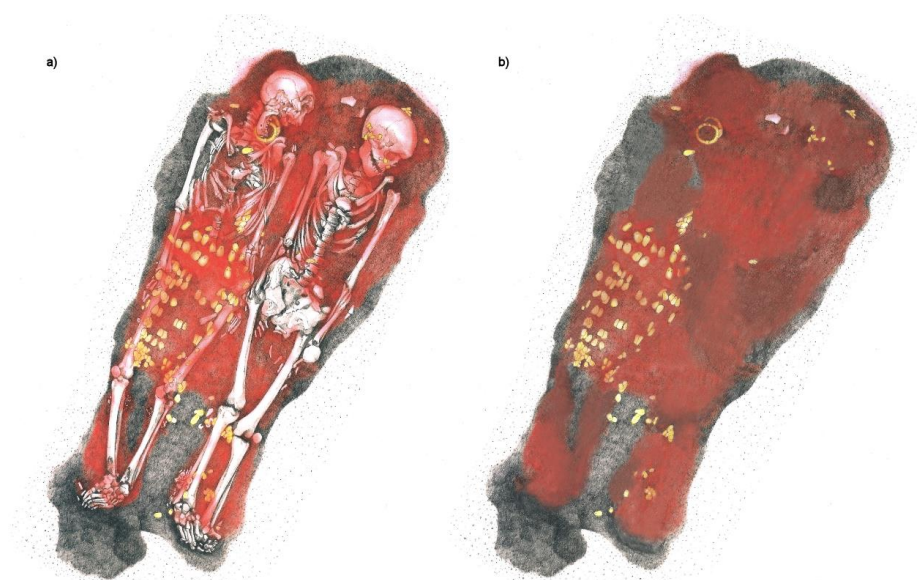


Figure 3. A) Double burial 316–317 from the Zvejnieki cemetery, northern Latvia. Adapted from Zagorska (2017, 95) (original drawing: L. Lecareux). B) Double burial 316–317 without human remains or other perishable materials. Original drawing edited by K. Lassila (2019), used with permission from I. Zagorska.

In contrast to the better-preserved graves beyond Finnish borders, the Finnish CWC graves have been recognised due to the occurrence of a Corded Ware assemblage, that is, complete pottery vessels, adzes and ground-stone axes (e.g., Edgren 1970; Edgren 1984, pp. 76–7; Nordqvist and Häkälä 2014). Although most of these artefacts were discovered as stray finds, on rare occasions

the artefacts have also been unearthed together in a grave-like pit structure of stained or sooty soil (Fig. 4) (e.g., Äyräpää 1931; Kivikoski 1934; Siiriäinen 1974; Torvinen 1979; Purhonen 1986). Since fragments of human molar enamel were discovered from one of these structures together with two stone adzes, a stone chisel and sherds of Corded Ware pottery (Äyräpää 1931), it seems reasonable to assume that such features indeed represent CWC graves.



Figure 4. Corded Ware grave I from the Jönsas cemetery, southern Finland. Note the pottery vessels along the NE and SW corners of the grave. Photo: T. Seger 1975, Finnish Heritage Agency.

In this thesis, these two initially different funerary practices that nevertheless share the tradition of an underground burial are observed side-by-side. Indeed, although Finnish CWC is normally connected to the arrival of a new population that practiced a different subsistence system — that is, pastoral farming — than the local populations (Äyräpää 1939; Edgren 1984, pp. 75–79; Nordqvist and Häkälä 2014; Cramp et al. 2014), the native hunter-gatherer groups and CWC immigrants existed side-by-side for several centuries (e.g., Halinen 2015, pp. 113–121). Thus, it is reasonable to assume that some type of social network — perhaps also present in mortuary practices — prevailed amongst these archaeological cultures. In the Finnish territory, this assumption is further supported by the fact that, occasionally, CWC earth graves and hunter-gatherer graves have been discovered at the same burial site (Torvinen 1979; Purhonen 1986; Ahola 2016). Thus, by observing the hunter-gatherer and CWC mortuary traditions alongside one another, it is not only possible to observe the Finnish Stone Age earth grave tradition as a whole, but also to trace both changes and continuity within this mortuary practice

1.2 PREVIOUS RESEARCH

In examining the prior research on Finnish Stone Age graves and mortuary practices, such studies are characterised by a lack of human remains. Indeed, despite discovering a well-preserved human skeleton at the Jettböle site in Åland as early as 1911 (Edgren 1984, p. 83), the presence of Stone Age inhumations in mainland Finland was determined during the 1930s with the discovery of the Perttulanmäki CWC grave in Southern Ostrobothnia (Äyräpää 1931). Whilst the presence of CWC graves was previously speculated based on stray finds of pottery and ground-stone battle axes discovered beneath settlement layers (Äyräpää 1915, pp. 10–11), the Perttulanmäki grave was the first CWC grave in which a grave structure including human remains (Äyräpää 1931, p. 6; Fig. 5) was revealed.



Figure 5. The Perttulanmäki (southern Ostrobothnia) Corded Ware grave at a depth of about 70 cm, facing south. Photo: A. Äyräpää 1930, Finnish Heritage Agency.

Following the discovery of the Perttulanmäki grave, several other CWC grave features were also documented or excavated (Kivikoski 1934; Edgren 1970). However, hunter-gatherer earth graves were not discovered until the late 1950s (Lappalainen 2007, pp. 5–6). Indeed, whilst ‘pits with blood-red soil and artefacts’ had occasionally been noted at Neolithic settlement sites as early as the 1920s (Edgren 1966, p. 97), it was not until Torsten Edgren’s excavations of the Middle Neolithic Kolmhaara cemetery (Appendix 1) during the late 1950s that the nature of these pits as Stone Age graves was fully understood

(Edgren 1959; see also Lappalainen 2007, p. 6). In 1958, Edgren excavated an ochre feature already damaged due to modern land use at the Kolmhaara site. Despite that damage, Edgren's excavations revealed an earth grave structure with intensive ochre, dozens of amber and flint artefacts and, most importantly, preserved human bones (Edgren 1959). Based on this discovery, it was clear that Stone Age hunter-gatherers in the Finnish territory also inhumed their dead (Edgren 1966, p. 98).

Edgren returned to Kolmhaara for several years (Edgren 1966) and uncovered an inhumation cemetery dating to the Middle Neolithic along with several stone cist graves with a more ambiguous dating (Edgren 1966; 1999; see also Mökkönen 2013). This seminal research not only set the scene for Mesolithic and Neolithic hunter-gatherer mortuary archaeology, but also introduced the term 'red ochre grave' (in Finnish, *punamultahauta*) to Finnish archaeology. Although well-rooted in Finnish archaeology, the term also introduces several problems (Lappalainen 2007, pp. 3–4). This is because the term has now been applied to both Mesolithic (e.g., Schulz 1999; Pesonen et al. 2014) and Neolithic (e.g., Miettinen 1992a-b; Katiskoski 2003; Mökkönen 2013) burial sites, whilst not emphasising changes that occurred in the material culture. Furthermore, not all hunter-gatherer earth graves from the Finnish Stone Age contexts were treated with ochre (Halinen 1999, p. 173; Lappalainen 2007, pp. 4–5). For example, at the hunter-gatherer burial site of Kukarkoski 1 (Appendix 1), several burials treated with flint artefacts dating to the Middle Neolithic period altogether lacked ochre (Torvinen 1979, pp. 60–62). Nevertheless, the term 'red ochre grave' continues to enjoy common use when referring to Finnish Stone Age hunter-gatherer burial sites.

From the 1950s onwards, the number of known hunter-gatherer and CWC earth grave sites grew to approximately 70 (Appendix 1). Although artefacts rarely accompany burial features possibly connected with the Mesolithic period (Edgren 1984, p. 23; Halinen 1999, p. 173), amber, flint and slate artefacts in pristine condition are continually discovered in grave site features associated with the possible Middle Neolithic Typical Comb Ware Culture (ca. 3900–3500 cal BC; henceforth, TCW) (e.g., Edgren 1966; 2006; 2007; Torvinen 1979; Miettinen 1992a-b; Engblom 1992; Halinen 1997; Katiskoski 2003), and thus have been used as an indicator of a Middle Neolithic earth grave (Edgren 1959; 1966, p. 99; Halinen 1999, p. 174). Similarly, CWC graves have often been recognised due to the occurrence of a typical Corded Ware grave assemblage (e.g., Edgren 1984, pp. 76–77; Nordqvist and Häkälä 2014).

Whilst the number of excavated grave structures has increased over time, most discovered structures still lack human remains. Consequently, direct radiocarbon determinations from either CWC or hunter-gatherer burials remain rare. In some cases, charcoal from the grave feature has been dated (Appendix 1). This is problematic, however, because even if the charcoal sample was connected to a grave structure (e.g., Torvinen 1979; Vikkula 1987), the dated material might also derive from elsewhere (Mökkönen 2013, p. 21). Thus, these

dates cannot be considered highly reliable. In rare cases, dates have also been obtained directly from human remains. Most of these dates are, however, at odds with the typological dating of the grave site itself (Appendix 1). Accordingly, this phenomenon has raised questions whether the AMS dates of materials so poorly preserved can be considered reliable (Edgren 1999; Schulz 2006; Mökkönen 2013; for a more detailed discussion, see Paper II).

Since radiocarbon determinations are usually unavailable, dating earth graves often relies on the typology of the artefacts found within the grave (Edgren 1966, p. 99, Edgren 1984, p. 76; Halinen 1999, p. 174). This method is reliable for burials that contain a strict material culture, namely, the CWC and TCW burials. However, such dating becomes more difficult with grave-like structures that do not contain artefacts. Because the graves are often situated at dwelling sites or in a nearby region (Appendix 1), graves lacking artefacts have often been dated according to the associated settlement sites (e.g., Edgren 1966, Appendix 1; Lappalainen 2007, Appendix 2). This is problematic, however, since the settlement might, for example, have had many phases of use (e.g., Purhonen and Ruonavaara 1994; Pesonen et al. 2014; for a more detailed discussion, see Paper IV) or the settlement was used as a burial site after its active phase of use (Núñez 2015, p. 97). Therefore, relative dating based on a nearby settlement site can also cause debate.

Perhaps due to problems relating to the preservation of the burial material, following Edgren's seminal work (Edgren 1966; 1970; 2006; 2007), only a few researchers have attempted to study the Stone Age earth grave phenomenon further (e.g., Halinen 1999; Miettinen 1992b; Lappalainen 2007). Indeed, whilst many sites have been written about following excavation, these publications have primarily remained descriptive in nature (Lappalainen 2007). Rather than relying on theory, these papers have largely focused on comparisons made to better preserved coeval burial sites in neighbouring regions of Finland that feature evidence of similar mortuary traditions (e.g., Torvinen 1979; Purhonen 1980; Vikkula 1987; Miettinen 1992a-b; Halinen 1997; Katiskoski 2003). Consequently, the primary research emphasis has focused on identifying the grave-like structures as graves and dating the structures either based on typology or through comparisons to material discovered beyond Finnish borders.

To summarise, the lack of human remains and other perishable materials has led archaeologists to either overlook Finnish Stone Age earth graves (as is often the case with international research) or simply describe rather than interpret such sites, structures and finds. Since hunter-gatherer earth graves in particular are often referred to as 'inhumations in simple pit graves' (e.g., Edgren 1966, pp. 90–96; 1984, 48; Vikkula 1987, p. 12; Miettinen 1992a, p. 13; Purhonen 1998, pp. 27–31), the illusion of a simple funerary practice is also maintained albeit unintentionally. Finally, whilst prior studies have occasionally observed remains from the perspective of the funerary ritual by training the gaze, for example, on the presence of possible food offerings (Katiskoski 2003), the use of fire (Purhonen 1980; Vikkula 1987) as well as to

internal grave structures made of wood, bark or stone (Torvinen 1979; Purhonen 1980; Vikkula 1987; Edgren 2006), these mortuary practices have only rarely been subjected to theory. Thus, the complexity of Stone Age burial practices remains poorly understood.

1.3 OBJECTIVES AND SCOPE OF THE DISSERTATION

This dissertation aims to compile the material remains and archival information from Stone Age earth grave sites and examine the material as a whole. As such, the approach adopted seeks to demonstrate that, whilst the Finnish Stone Age earth graves primarily lack human remains and other perishable materials, we can still gain important new insights into Stone Age funerary practices. Consequently, the objective of this thesis lies in systematically studying earth grave materials, attempting to understand the rituals behind them and using these data to interpret mortuary practices and the surrounding cosmology.

Accordingly, this thesis focuses the objectives on three specific research themes:

- 1) To generate detailed information about Finnish Stone Age earth graves;
- 2) To use that information to interpret mortuary practices; and
- 3) To use these data to interpret prehistoric cosmology.

This thesis consists of five original articles (Papers I–V) that address the research themes from several different angles. To visualise the interconnect- edness of these individual papers, Table 1 illustrates their relations to one another.

	Paper I	Paper II	Paper III	Paper IV	Paper V
RT 1	x	x	x		x
RT 2	x	x	x	x	x
RT 3	x		x	x	x

Table 1. The interconnectedness between individual papers and their relationship to the research themes. RT 1 = Generating detailed information about Finnish Stone Age earth graves, RT 2 = Stone Age mortuary practices within Finnish territory, RT 3 = Stone Age cosmology given the mortuary material

1.3.1 RESEARCH THEME 1: GENERATING DETAILED INFORMATION ABOUT FINNISH STONE AGE EARTH GRAVES

The first research theme aims to generate detailed information about Finnish Stone Age earth graves. Because this phenomenon has not been studied as a

whole previously, a systematic archaeological research review is warranted. Simultaneously, this research theme serves as a foundation for the subsequent themes.

In this study, detailed information about Finnish Stone Age earth graves is gained by:

- 1) compiling all available data from Finnish Stone Age earth graves;
- 2) resolving how many earth graves and grave finds are known and from which period(s);
- 3) exploring the characteristics of earth grave structures; and
- 4) examining the sparse human remains and the material culture of death.

The first article (Paper I) contributes to the first research theme by observing the grave structures and the use of ochre in a wider international context. The paper also highlights that the results obtained from studies that have focused specifically on the bodies or the body position of the deceased (e.g., Nils-son Stutz 2003; Tõrv 2016) can benefit the Finnish burial material even if human remains were not preserved.

The second article (Paper II) focuses on the sparse human remains discovered from Finnish Stone Age earth graves. However, that article not only provides an overview of the human osteological materials and the challenges of studying these poorly preserved fragments, but also summarises the characteristics of burial features and their prior study. Furthermore, this article also presents data on the available AMS dates from Stone Age earth graves and discusses the problems relating to those dates.

The third article (Paper III) supports the first research theme by introducing the first ever animal pelt — the remains of a goat skin — from a CWC grave. With these results, the article shows also the enormous potential of analysing the largely overlooked soil samples collected from earth graves. In contrast to Paper III which deals with a single grave structure, the fifth article (Paper V) provides a detailed information on the material culture of death from hunter-gatherer earth graves using grave objects collected from nearly 60 grave structures. Simultaneously, this article provides up-to-date information on the number of hunter-gatherer burial sites.

1.3.2 RESEARCH THEME 2: STONE AGE MORTUARY PRACTICES WITHIN FINNISH TERRITORY

The second research theme aims to describe Stone Age mortuary practices within Finnish territory. This aim is pursued by:

- 1) applying the Stone Age earth grave material to theoretical knowledge;
- 2) comparing the Finnish material given current knowledge on Stone Age funerary customs to materials beyond Finnish borders; and

- 3) investigating the connections between hunter-gatherer and CWC funerary practices.

The second research theme is addressed from various angles and with varying emphasis in all of the original publications upon which this dissertation is based. Papers I and IV present both an in-depth reanalysis of a Stone Age cemetery site by observing the mortuary materials of the site as a whole and subjecting them to theoretical knowledge and interpretation. The main purpose of both studies lies in illustrating the complexity of the Stone Age mortuary practice. Simultaneously, the Finnish mortuary data is compared with data from other regions.

Papers II, III and V describe the mortuary practices from the angle of material culture. Accordingly, the second article (Paper II) contributes to the research theme by exploring who was buried in the earth graves, whilst the third article (Paper III) concentrates on investigating CWC funerary practice in the light of identity and offering new insights regarding how CWC grave structures were prepared.

In Paper V, the hunter-gatherer mortuary practice is explored from the perspective of grave objects. As a larger narrative, the material is viewed in the light of change and continuity in the material culture of death amongst ancient hunter-gatherers. Simultaneously, general trends in how certain materials or artefact types were used in mortuary practices are also explored.

Papers I, III and IV investigate the similarities between hunter-gatherer and CWC mortuary practices. In addition, Papers I and IV introduce burial sites with both CWC and hunter-gatherer earth graves, a phenomenon explored further in Paper IV. By contrast, Paper III ponders how and why CWC graves differ from hunter-gatherer graves in terms of the material culture.

1.3.3 RESEARCH THEME 3: STONE AGE COSMOLOGY GIVEN THE MORTUARY MATERIAL

In order to situate Finnish Stone Age burials and mortuary practices within the broader context, the third research theme aims to explore what mortuary remains encode vis-à-vis Stone Age cosmology. According to, for example, rock art studies (Lahelma 2008; Gjerde 2010), Stone Age cosmology in northern Europe is understood as animistic–shamanistic. Thus, this third research theme aims to determine whether the mortuary material also fits this model and, if so, how. The research theme is approached by:

- 1) investigating the graves and mortuary practices given other coeval ritual sites and actions;
- 2) exploring the grave customs and locations of burial sites in the light of animistic–shamanistic cosmology; and
- 3) examining the role of memory and past generations in that cosmology.

This third research theme is considered in the first, third, fourth and fifth articles (Papers I, III, IV and V). In Paper I, it is argued that Stone Age populations pursued caring for and connecting with past generations buried in earth graves. This, on the other hand, suggests that past generations were important in the cosmology of Stone Age people. The topic is explored further in Paper IV, whereby the connection to past generations — either by ritually re-using old burial sites or by positioning new burials intentionally amongst older ones — is observed. Paper IV discusses the cosmology also given the ritual landscape aiming to identify associations with rock art sites.

The third article (Paper III) explores the topic of cosmology from the perspective of the CWC phenomenon and given human–animal relationships. Paper V, however, concentrates on hunter-gatherer populations and attempts to understand the material culture of death through the lens of Stone Age cosmology.

2 THEORETICAL BACKGROUND

2.1 MORTUARY ARCHAEOLOGY AND THE RITUALS OF DEATH

The theoretical background of this dissertation lies within in mortuary archaeology. Mortuary archaeology is a field of study situated in between scientific and cultural approaches (Tarlow and Nilsson Stutz 2013). Indeed, when studied using various bioarchaeological methods, for instance, interred human remains can provide important information on the health, diet, origins and kinship of ancient populations. However, when observed from a cultural perspective, information on the social organisation, cosmology and rituals of death can also be obtained. In an ideal study, these approaches can be combined by verifying an initial hypothesis arising from the cultural tradition using scientific methods.

From a theoretical point of view, mortuary archaeology has been dominated by three major approaches: culture-historical archaeology, processual archaeology and post-processual archaeology (e.g., Parker Pearson 1999). Graves have, of course, also intrigued the minds of early antiquarians, although this study primarily concentrated on artefact collection or craniometrical studies (Stout 2013). During the late nineteenth century, however, the culture-historical approach brought funerary monuments and mortuary evidence to the very core of archaeological study by viewing them as a key element in determining cultural signatures (Trigger 2006, p. 299). The overall aim of this approach was not, however, to describe burial rites, but in determining archaeological cultures.

The culture-historical approach dominated mortuary archaeology until the 1960s. Whilst the approach flourished in certain parts of Europe even after the mid-twentieth century (Törv 2016, pp. 25–28), from the 1960s onwards, many burial sites were examined through the lens of processual archaeology. Drawing from the Saxe-Binford hypotheses (Saxe 1970; Binford 1971), the core idea in processual mortuary archaeology was to regard funerary practices as direct representations of the socio-political role of the deceased. For example, graves containing weapons were viewed as warrior graves, whilst richly furnished graves were interpreted as the graves of elites

Since the 1980s, the positivist-derived universals proposed by processual archaeologists received criticism from the so-called post-processual tradition. According to this approach, burials did not encode the socio-economic roles of the deceased, but were rather a form of symbolic communication in which the social meaning of the grave objects could not be disconnected from their ritual framework (e.g., Parker Pearson 1982; Shanks and Tilley 1982; Hodder 1986; see also Ekegren 2013). Indeed, as Härke (1994, p. 32) explained, burials do

not reflect the realities of the deceased, but the images of the roles those arranging the burial had on the deceased individual. That is, according to the post-processual tradition, prehistoric burials encode the funerary practices those living perform for the dead.

Although theoretical approaches vary, a common theme amongst mortuary archaeology relies on the application of anthropological literature concerning death and burial. Indeed, according to Ekegren (2013, pp. 176–177), several theoretical points of departure were significant amongst both social scientists and archaeologists dealing with mortuary practices. Perhaps the most influential theoretical position has been the idea of death as a social passage (Hertz 1960 [1907]). According to this paradigm, the identity of the deceased was removed by a temporary earth burial and given a new identity in the afterlife by a secondary burial. This notion of death as a social passage was developed further by Arthur van Gennep (1960 [1909]) in his theory of the *rites of passage*. According to this much-cited theory, further developed, by anthropologists such as Victor Turner (1967), funerary rites represent transition rituals that can be divided into three phases: rites of separation (pre-liminal phase), rites of transition (liminal phase) and rites of incorporation (post-liminal phase). Amongst these, the pre-liminal phase is viewed as the moment of dying, when a living, social being turns into a cadaver. During the liminal phase, the individual exists in an ambiguous in-between state before the burial, whilst the post-liminal phase establishes the individual's new state of being, for example, as an ancestor. By moving through the different stages of transition, living society also negotiates a new social relationship with the deceased.

The third major influence of anthropology seen in mortuary archaeology lies in the idea of ritual as performance or practice. These theories were influenced by the work of Pierre Bourdieu (1977) and Anthony Giddens (1979) and are often referred to in the archaeological literature through the work of Catherine Bell (1992) (Ekegren 2013, pp. 177–178). According to these theoretical viewpoints, social structures, traditions, conventions and the like are shaped through human action. In turn, these structures are also the medium through which further action is created. From this perspective, rituals are viewed as dynamic processes rather than static containers of meaning. That is, rituals are understood as embodied practices, where the bodily practices are more important than the meaning of the ritual (Bell 1992; see also Nilsson Stutz 2003). For example, funerary rituals could be performed 'the way they have always been done' or 'the way that our ancestors taught us to do them', thus emphasising practice over meaning (Nilsson Stutz 2003, p. 319).

2.2 STONE AGE MORTUARY ARCHAEOLOGY IN NORTHERN EUROPE

Whilst various theoretical approaches remain largely missing from the study of Finnish Stone Age mortuary archaeology, the study of many northern European hunter-gatherer burial sites³ have turned to both processual archaeology and to post-processual archaeology. For example, when burial sites at Skateholm and Vedbæk Bøgebakken (southern Scandinavia) were excavated, the processual paradigm had already strongly impacted Scandinavian Mesolithic archaeology (Larsson 1990), thus dominating the initial consideration of those sites (Nilsson Stutz 2003, p. 163). During the past decade, however, theories arising from the post-processual paradigm (e.g., Strassburg 2000; Nilsson Stutz 2003) have also been applied to the study of these places of burial. More recently, the number of studies applying scientific approaches — particularly genetic studies — has also rapidly grown (e.g., Saag et al. 2017; Jones et al. 2017; Günther et al. 2018).

In contrast to hunter-gatherer mortuary archaeology, the study of the CWC graves has primarily relied upon the culture-historical and processual tradition, thereby concentrating on classifying and defining grave goods (e.g., Fischer 1956; Malmer 1962; Edgren 1970; Ebbesen 2006; Arvidsson 2006). In fact, the entire existence of CWC is based on a strict set of funerary practices in which gender differentiation (based on the orientation of the body) and furnishing graves with battle axes and cord-decorated beakers are distributed across a large area (e.g., Arvidsson 2006; Furholt 2014, fig 2; Larsson 2009a, pp. 60–61). Although attempts to identify ethnicity within archaeological cultures has been widely rejected since then (Trigger 2006, p. 310), echoes of this culture-historical approach remain visible within several recent genetic studies concerning CWC human remains (Heyd 2017).

Recently, the entire existence of a uniform CWC has been questioned by noting that, despite the existence of a homogenous material culture of death, the objects or symbols used in graves might not have been connected to the same ideas across the entire distribution area (Furholt 2014, p. 82). Interestingly, however, a recent study (Bourgeois and Kroon 2017) showed that homogenous grave goods also accompanied shared sets of practices. This study, which concentrates on the ritualised nature of CWC graves, however, represents a rare exception in the field of recent CWC mortuary archaeology. In fact, although researchers such as Larsson (2009a) and Berggren and Brink (2010) have also emphasised rituals or cosmology within CWC grave contexts, most recent studies concerning CWC graves focused on the scientific study of the biological remains (e.g., Haak et al. 2015; Allentoft et al. 2015; Sjögren et al.

³ In this chapter, when referring to Stone Age hunter-gatherer and pastoralist graves and Stone Age mortuary archaeology, I refer primarily to the material most relevant to my research materials, that is, the Mesolithic and Neolithic hunter-gatherer graves of the Baltic area and the European forest zone along with Corded Ware graves from Scandinavia, the Baltic countries and central Europe.

2016; Kristiansen et al. 2017). In this sense, CWC mortuary archaeology signifies a shift towards scientific archaeology, whilst paying less attention to cultural approaches.

In the case of Stone Age hunter-gatherer mortuary archaeology in Scandinavia and the Baltics, recent trends appear to focus on the role of the dead body in the mortuary ritual (Nilsson Stutz 2003; Törnv 2016). For example, following philosopher Kristeva (1980), Nilsson Stutz (2003; 2010) focused on the liminal character of the human body, stating that the body — still resembling the living person — is now a corpse. Indeed, situated somewhere between life and death, the body is neither a subject nor an object. Rather, it is the ultimate abject, a consequential threat to order and society.

To understand the abject role of the cadaver, Nilsson Stutz introduced the archaeoethanatomical method — a cross-disciplinary method combining taphonomic knowledge with osteology, anatomy and archaeology (Duday 2009) — to Scandinavian Stone Age hunter-gatherer mortuary archaeology (Nilsson Stutz 2003). As a result, Nilsson Stutz's (2003) analysis of the Mesolithic cemeteries of southern Scandinavia showed that the core mortuary practice in Mesolithic graves was a primary burial where the natural processes of decomposition were hidden by burying the individual underground and immediately filling the burial pit. The body was carefully positioned in the grave in a lifelike manner and sometimes placed on platforms or paddings in order to separate the body from the floor of the burial pit. In some cases, the body was also wrapped. In most cases, artefacts and ochre were placed in the burial with the dead.

Nilsson Stutz's analysis (2003) contested the processual hunter-gatherer mortuary archaeological perspective, and shifted the focus from the grave goods to the dead body and the identities the body assumed in death (Nilsson Stutz 2003; see also Conneller 2013). Following Nilsson Stutz's seminal work, the archaeoethanatomical approach was successfully applied to other Mesolithic and Neolithic hunter-gatherer materials (Peyroteo Stjerna 2016; Törnv 2016), whilst a recent study (Varul et al. 2019) piloted the approach by applying it to a CWC burial site.

We must note that all of these studies have concentrated on inhumation burials. However, if we consider the total number of individuals buried at the cemeteries or settlement sites, it becomes clear that these sites represent only a fraction of the buried population (e.g., Huurre 1998; Strassburg 2000; Nilsson Stutz 2014), a fact that also applies to Finnish CWC burial sites (Appendix 1). Indeed, even if we consider the possibility that many additional burial sites have been destroyed or not yet identified, it seems reasonable to assume that multiple funerary practices co-existed (e.g., Brinch Petersen and Meiklejohn 2003; Lõhmus 2007; Larsson 2009a; Fahlander 2012; Nilsson Stutz 2014). In fact, although some funerary practices — for example, air burials — could remain inaccessible to the archaeological evidence, loose human bones are commonly found at Stone Age hunter-gatherer sites (Meiklejohn 2017, p. 94). Previously, loose human bones with or without cut marks have often been

interpreted as evidence of cannibalism (e.g., Núñez 1995; see also Sørensen 2016, p. 65). However, recent studies have favoured an interpretation suggesting unknown mortuary rituals and post-mortal manipulation. For example, Gray Jones (2011) demonstrated that disarticulation and defleshing appear to have served as part of the treatment of the dead. Along the same line of thought, Tõrv (2016) argued that, whilst most of the loose human bones discovered from the Estonian territory stem from destroyed inhumations, the post-burial manipulation of corpses was also practiced.

Yet, by focusing solely on the human body, other aspects of the mortuary ritual may be overlooked. For example, Tõrv (2016) excludes grave goods from her research. Although Tõrv (2016, p. 30) acknowledges that these objects might have played a role in hunter-gatherer burial rites, she nevertheless states that the majority of them probably were part of the funerary dress and thus, not relevant to mortuary practices relating to the handling of the body. This view, however, is not entirely accurate. In fact, according to ethnographical and historical examples, grave goods represent meaningful objects ranging from items used to handle the dead body to objects deposited with the deceased in the grave to items used by the bereaved during the funeral rite (Ekengren 2013, p. 174). For example, in the nineteenth century funerary tradition of rural Finland, the deceased was often washed with water stored in a bowl with a silver coin (Waronen 1898, pp. 56–58). After this purification ritual, the deceased was dressed in fine clothes, although the sock from the left foot was placed on the right foot and vice versa. Moreover, all of the personal possessions of the deceased, along with the items relating to the handling of the body, were often burned or broken so that the soul of the deceased would depart in peace (Waronen 1898, pp. 88–89).

Accordingly, in nineteenth century Finland, the dead body was not only cared for but also feared. Rather remarkably, however, these mortuary practices appear related to objects rather than the dead body. In fact, given ethnographical examples, items relating to the dead body are no longer neutral objects. Instead, similar to the dead body, such items are ambiguous and in-between requiring special treatment — that is, they are abjects. Indeed, whilst the dead body can be seen as the ultimate abject, the material remains in a burial should always be observed as a part of a whole. In fact, as Ekengren has rightfully stated (2013, p. 182):

Part of our focus should therefore be a spatial analysis of the layout of the grave and the arrangement of objects; in other words, what people did with the objects in relation to other material culture, including the dead body.

According to Ekengren (2013), a grave should be understood as a sequence of actions in which the grave goods were selected, deposited, arranged and given meaning by one or more persons during the course of the funeral. Thus, attention should be placed on several aspects ranging from the typological and technological features to the physical condition of the objects included in the

grave site. As Ekengren explains (2013, pp. 182–183), by observing the typological features, we find that the objects were considerably older than the burial itself or that they were imported from distant areas. The physical condition of the object could also reveal that items were deliberately broken, an idea often connected either to social exchanges in which holding fragments of the same object links people and places (e.g., Chapman 2000; Fowler 2004) or to ritual killing of potent objects (Chapman and Gaydarska 2007; Gravel-Miquel et al. 2017).

Aside from the typological features, the material of manufacture along with the colour and texture of the object could provide further clues regarding how these items were perceived by participants to the ritual (Ekengren 2013, p. 183). For example, by examining Stone Age hunter-gatherer grave finds from the perspective of zooarchaeology, Kristiina Mannermaa (2013) argued that bird wings were deliberately placed in the burials. According to Mannermaa (2013, pp. 194–195), deep blue jay (*Garrulus glandarius*) wings, for example, appear to have been used in the decoration of burial garments. Aside from emphasising colour preferences, however, Mannermaa suggests that the wings might also have carried several other more fundamental meanings connected to the symbolic world and broader ideology. Indeed, the blue jay with its social and migratory behaviour, similar to that of humans, might have been considered as a totem animal; by attaching the blue jay wings to the burial garments, people might have mimicked the totem's ability to fly (Mannermaa 2008, p. 196).

2.3 FROM GRAVES TO COSMOLOGY AND BELIEF SYSTEMS

As Mannermaa's (2013) research shows, the physical remains of a burial do not alone encode the ancient mortuary practice. Rather, they can also be used to understand the cosmology and beliefs behind such practices. Until recently, the study of prehistoric religions or beliefs did not represent a central component of archaeological research. Within the last decade or so, the study of religion and religious rituals has, however, become a routine part of archaeological investigations, where concepts such as 'memory', 'movement', 'time' and 'space' feature as the focus of research (Insoll 2011a). These approaches to the archaeological study of religion challenge the prior tradition in which the catalogued material remains of religion and ritual were considered static residues.

Yet, when studying a prehistoric period that lacks written and oral accounts, our source materials for ritual practices remain limited to the physical remains of past actions. At first glance, this material might seem impossible to interpret or uncover. How could we ever understand cosmology or belief systems without the benefit of a living religious tradition? According to Nilsson

Stutz (2010; 2014), the answer lies in the ritual practice itself. Following Bell's (1992) thinking, Nilsson Stutz (2014, p. 712) argues that a cosmology is created through a ritual practice that structures the world:

The ways people treat their dead tell us a lot about their life and view of the world, their cosmology. When facing the crisis of death, people use ritualized practices to call on fundamental structures and ideas of who they are and why they are in the world. Death has to make sense, and the mortuary rituals are thus connected to the cosmology that structures and is structured by practices of the living.

In other words, death occupies a position within the cosmology through ritual, which is culturally and socially acceptable (Nilsson Stutz 2010a, p. 35). Consequently, by observing how the image of death was created (i.e., through the material remains of the mortuary practices), glimpses of the ancient cosmology can also be constructed.

2.3.1 ANIMISTIC–SHAMANISTIC COSMOLOGY

To understand cosmology, the material remains need to be observed in light of something that resembles a living religious tradition. In prior studies concerning Stone Age cosmology, an equivalent to a living tradition was sought from an ethnographic analogue (e.g., Insoll 2004, pp. 53–59). For example, Zvelebil (2003) argued for a shared 'northern hunter-gatherer cosmology' between Mesolithic people and contemporary and historic northern European hunter-gatherers and herders. In general, this shamanistic cosmology includes the concept of a three-tiered world — that is, a world divided into an upper layer of gods and spirits, a middle layer of humans and animals, a lower layer of human- or animal-like creatures and, occasionally, the spirits of the dead (e.g., Pentikäinen 1990). Other important factors in the northern hunter-gather cosmology consist of a religious specialist ('shaman') who intercedes with various spirits and travels in between the different layers of the world, along with a strong association between death and water (Zvelebil 2003).

According to Conneller (2014, p. 349), Zvelebil's research represents a part of a broader trend in early prehistory that originates in rock art studies. For example, Helskog (1999) and Gjerde (2010) used ethnography to study Fennoscandian rock art in relation to cosmology. Indeed, according to Gjerde (2010, pp. 442–443), many examples of human representations in Fennoscandian rock art can be interpreted as shamanistic journeys, suggesting that rock art sites encode shamanistic cosmology. The most common motifs in Fennoscandian rock art, however, consist of big game and migrating animals (Goldhahn and Fuglestad 2012, p. 239). This, however, also signifies the central role played by animals and hunting in arctic cosmology and rituals (Gjerde 2010, p. 446). Indeed, among the indigenous peoples of north-eastern Siberia, hunting is still practiced in highly controlled ritual enactments that ensure a

balance between man, animals and the spirits (Willerslev et al. 2014). According to Gjerde (2010, pp. 446–447), this knowledge of both cosmology and reality—a cosmography—has been described in rock art sites that also served as signposts indicative of good hunting places or favourable places for animals.

The tradition to use ethnography to study cosmology appears also in the Finnish archaeology. For example, Lahelma (2007; 2008) used a direct historical analogue to interpret Neolithic rock art. As a result, Lahelma suggested that rock art belongs to the same tradition as *siedis*, or offering places traditionally used in the ethnic religion of the Sámi people (Lahelma 2008). According to Lahelma (2005; 2007; 2008), art was likely created during a shamanistic trance on impressive cliffs, which sometimes appear anthropomorphic in shape and could relate to the need to tap the supernatural powers inside the cliffs. This interpretation is further supported by the iconography of the paintings, which often depict, for example, human-like figures transforming into animals (Lahelma 2008, pp. 57–58). Occasionally some figures also appear to be falling or emerging from a crack in the rock, a phenomenon Lahelma interpreted as a shamanistic journey between the different layers of the world (Lahelma 2008, p. 59; see also Gjerde 2010, pp. 417–419). Simultaneously, sensory aspects, such as touching the cliff with ochre paint or listening to the powerful sounds of the rapids or echoes, may also have contributed to the location of the rock art (Lahelma 2007, 131; see also Rainio et al. 2017). Accordingly, Lahelma (2008) concluded that Finnish rock art can be associated with a religious complex involving shamanistic and animistic notions.⁴

Lahelma is not alone in suggesting an animistic–shamanistic cosmology in the Finnish Neolithic. Indeed, drawing upon examples from more profane phenomena, such as clay works and pottery, Herva, Mökkönen and Nordqvist (2017) proposed that these practices and objects also encode an animistic and shamanistic cosmology. Herva, Mökkönen and Nordqvist (2017, p. 34) stress that during a period from the later sixth millennium BC to the fourth millennium BC, people increasingly engaged with different minerals by digging into ground—that is, the underworld. According to Herva, Mökkönen and Nordqvist (2017, pp. 30–36), this connection to the underworld rendered the newly introduced pottery vessels more than just a necessity. Indeed, rather than a mere container for goods, a pot resulted from practices that involved

⁴ Although ‘shamanism’ and ‘animism’ are commonly used concepts in the archaeology of religion, neither should be mistaken as an established religion (Price 2011; Insoll 2011b). On the contrary, shamanism is an anthropological category created during the period from the late seventeenth to the late nineteenth century by, for example, missionaries and scholars who travelled to Siberia and told tales of a world inhabited by spirits, and of special people altering their state of consciousness to communicate with the spirit world (Price 2011, pp. 983–985). In a similar way, the concept of animism derives from older evolutionary thinking about religion and relates to a world view in which everything—from humans and animals to inanimate objects and natural features—is alive and possesses a soul of their own (Ingold 2001; Insoll 2011b). In this study, the animistic–shamanistic worldview is not considered an established religion, but a general description of how to comprehend the world (cf. Ingold 2001).

digging into the underground world, working with a material that could be re-worked endlessly and gradually transforming it into a different kind of substance with fire. In other words, an object calling for the status of an abject.

According to these studies, it seems reasonable to assume that the Neolithic people of the Finnish territory lived in a layered reality in which humans, inanimate objects and natural features were considered alive. Consequently, the mortuary rituals practiced in the Finnish territory during this period should also be connected to this cosmology and, thus, animistic and shamanistic features should be present in the material remains of the mortuary practices. In fact, some evidence points to a connection already existing: for example, Finnish rock art is painted with ochre, and, on rare occasions, is also connected to artefact deposits (anthropomorphic amber pendants) used as burial objects in hunter-gatherer graves (Lahelma 2008, p. 37). These points of connection suggest that the ritual practices connected to rock art and burials already share a material culture in which the use of certain materials (ochre and amber) and artefact types (pendants) were considered important. This, by contrast, also supports the theory that the two different ritual practices cipher the same cosmology.

2.3.2 SOCIAL MEMORY AND PREVIOUS GENERATIONS

When dealing with mortuary materials, we can also examine Stone Age cosmology by exploring the role of the buried individuals or past generations within this worldview. In archaeology, these phenomena are often interpreted from the perspective of the 'past in the past' (e.g., Bradley 2002; Borić 2010; Larsson 2017). This theory relies on the concept of social memory — that is, the collective notion of how things were in the past (Connerton 1989; Zerubavel 2003), suggesting that prehistoric societies lacking written records formulated their sense of the past through an oral tradition and the material remains of previous generations (Bradley 2002). Such traditions existed worldwide and are commonly accepted as intentional behaviour relating to how people interpreted the remains of past activities in their surroundings (Bradley 2002; van Dyke and Alcock 2003; Borić 2010; Williams 2013; Bourgeois 2013).

According to radiocarbon determinations (e.g., Zagorska 2006; Piezonka et al. 2014), some Stone Age hunter-gatherer burial sites were used for long periods of time and, occasionally, reused after a hiatus of several hundred years. This suggests that these sites were not only a mere disposal area for the dead, but also represented significant places to which people returned even after millennia. When observed through the lens of social memory, the long-term use of the same burial site or the reuse of an older cemetery typically indicates a need to connect or re-connect to previous generations (e.g., Williams 1997; Wickholm 2006; Wessman 2010, p. 95; Turek 2014). For example, at the Zvejnieki cemetery, people were not only interred in the same site for

several millennia (Zagorska 2006), but, occasionally, new burials were also dug through older ones (Nilsson Stutz et al. 2014). Furthermore, the fill of the grave was taken from an old settlement site a short distance away (Larsson 2017). Indeed, at Zvejnieki, being a part of the place itself seems to have represented a crucial component of the mortuary practice (Nilsson Stutz 2010a, p. 38). However, since similar practices were also noted at other Stone Age hunter-gatherer burial sites (e.g., Andersson 2004; Borić 1999; Peyroteo Stjerna 2015), mixing past and present seems to form one way in which death was granted a place within the cosmology of Mesolithic and Neolithic hunter-gatherer societies.

The manifestation of social memory is not, however, restricted to Stone Age hunter-gatherer mortuary practices. Indeed, Jeunesse (2014) noted that that in central Europe the CWC people occasionally reused old burial monuments at new burials. Following the tradition of regional variation (e.g., Furholt 2014), this phenomenon is not present in all areas inhabited by CWC. However, in Malzyce (Poland), for example, several CWC graves were discovered from an earlier tumulus or within close vicinity (Włodarczak 2008, p. 252), whilst in the Baltic area CWC graves were also found in the less visible hunter-gatherer cemeteries (Torvinen 1979; Purhonen 1986; Loze 2006; Zagorska 2006; Butrimas 2012). It, thus, seems possible that creating a link to the past also formed a part of the Corded Ware funerary repertoire.

To summarise, by observing how social memory manifests in burial contexts, we gain yet another angle via which to study cosmology and belief. This approach not only anchors the study of Stone Age mortuary practices to current approaches to the archaeological study of religion, but also provides an opportunity to observe the role of previous generations in the prehistoric worldview. Indeed, by identifying what burial sites encode as active residues, we can see how these significant places were remembered, forgotten and recreated as part of mortuary practices. That is, we can better construct how the world was structured and how cosmology was created through death rituals.

3 RESEARCH MATERIALS AND METHODS

After outlining the theoretical framework, I now turn to the Finnish Stone Age graves. The research material in this study consists of previously excavated materials from approximately 70 Stone Age earth grave sites in mainland Finland (Appendix 1). This study relies on known sites and archived material for several reasons. First, previously collected material has been poorly subjected to theory; second, that material has not been examined as a whole; and, third, it has rarely been analysed using modern scientific methods. Furthermore, since these materials derive from excavated human burials, ethically we must study the material as thoroughly as possible (for a further discussion, see Sayer 2010; Scarre 2014).

The previously excavated materials studied in this thesis consist of the archaeological finds (e.g., human remains, artefacts and other finds from grave contexts), soil samples, photographs, drawings, site plans, written reports and radiocarbon determinations collected and produced during the past hundred years. In this thesis, the material is approached by entering all available data into a database and investigating it as a whole. Since the studied materials include, for example, written reports, human remains and radiocarbon determinations, varying methods have, however, been applied. In the following subsections of this chapter, the methods used for various different materials will be explained further.

3.1 ARCHIVAL MATERIAL

The archival material used in this study consists of all the excavation reports, photographs, site plans, drawings and radiocarbon determination reports from Stone Age earth grave sites. These materials are stored in the collections of the Finnish Heritage Agency. The body of data for these materials was collected from publications, the Finnish Heritage Agency find catalogue (NM) and unpublished excavation reports. They were primarily researched on the premises of the Finnish Heritage Agency.

3.1.1 EXCAVATION REPORTS

For this study, approximately 100 excavation reports dating from the twentieth century to the present were read. Since these records are not objective portraits of the original sites, but rather heavily rely on the individual perceptions of a particular excavator, team of archaeologists or site director (e.g., Swain 2012), this material was critically read, a method aiming to distinguish the interpretation of the site director from the excavated data. In practice, in-depth

reading of the excavation reports of the written descriptions was compared to drawings and photographs of the grave features. Occasionally, site directors were also interviewed.

3.1.2 PHOTOGRAPHS AND DRAWINGS

Varying amounts of photographs and drawings accompanied most reports. In the best cases, the grave structures were photographed and drawn after each layer was excavated. In such cases, the excavation of the burial was easy to follow and resulted in detailed information regarding the grave. However, photographs remained scarce until the 1980s due to the lack of proper equipment (cf. Edgren 1998). This resulted in grave features being photographed only once or twice during the excavation. Similarly, drawings have also remained scarce, particularly for earlier excavations, whereby grave structures might lack both photographs and drawings. Thus, the information obtained from these burials relies solely on written descriptions.

3.1.3 SITE PLANS AND MAPS

For larger cemeteries, site plans and topographical maps of the area were also studied. Such analyses aimed to understand how graves are situated in relation to one another and the surrounding landscape. Aside from topographical maps, sites were also visited, by placing special emphasis on the landscape features not affected by issues such as isostatic land uplift and modern-day land use. These features include features such as hills, bedrocks and large, natural boulders and topographical anomalies — that is, impressive natural formations that stand out from the surrounding landscape. Hypothetically, the presence of such features could have affected the location of the cemetery (e.g., Anttonen 1993; Bradley 2000).

3.2 FIND MATERIAL

The archaeological find material associated with Finnish Stone Age earth graves consists of roughly 8000 human skeletal fragments, roughly 4000 artefacts or other finds (such as pieces of birch bark or clay) and around 200 unanalysed ochre or soil samples. Similar to the archived material, these data were collected from publications, the Finnish Heritage Agency find catalogue (NM) and unpublished excavation reports. For this study, the artefacts and human bones were examined primarily on the premises of the Finnish Heritage Agency, whilst soil samples were analysed at the Nanomicroscopy Centre of Aalto University in Espoo.

3.2.1 HUMAN REMAINS

In this study, all human remains were compiled together and subjected to a new human osteological analysis conducted by Kati Salo, PhD, in 2015 (Paper II). Whilst osteological analysis aimed to follow key aspects of human osteological analysis (e.g., skeletal anatomy, bone physiology, morphology, growth and development), we must note that the skeletal material was very fragmentary in nature. Thus, fragments were identified only by species and anatomical elements. Furthermore, due to the scarcity of the material, all age groups used by skeletal biologists (e.g., Scheuer and Black 2000) could not be applied. Rather, individuals were aged only as ‘adults’ or ‘subadults’.

3.2.2 ARTEFACTS AND OTHER FINDS

Similar to the human osteological material, artefacts and other finds from hunter-gatherer earth graves were also compiled together and examined with the naked eye. Furthermore, these finds were also documented with photographs and written descriptions resulting to an open-access⁵ catalogue, entitled ‘Catalogue of Stone Age Hunter-Gatherer Earth Grave Finds from Mainland Finland (2017)’ published within Paper V. In contrast to hunter-gatherer grave objects, CWC grave objects were primarily examined through the literature. In addition, objects currently (2019) or previously on display at the Prehistory exhibition of the Finnish National Museum were examined at the museum premises.

3.2.3 SOIL SAMPLES

Beyond collecting data on the find material from graves, information on the soil samples collected from the graves was also compiled. Whilst most of these samples consist of ochre, soil samples were also occasionally collected from CWC contexts. For this study, a microarchaeological case study was conducted on the most promising material (Paper III). Microarchaeology as a method seeks to understand the microscopic archaeological record (Weiner 2010; Kirkinen 2019). In practice, this means information is often extracted from soil samples and collected through microscopic examination or by floating. In burial contexts, this record can consist, for example, of fibres and hairs. One of its strengths lies in eliciting information from perishable organic materials such as clothes, ornaments and grave furnishings identified based on their morphology using optical microscopes and a scanning electronic microscope (SEM) (e.g., Vajanto 2013; Kirkinen 2015, 2019). The microarchaeological case study presented in Paper III was undertaken by Krista Vajanto, PhD, and Tuija Kirkinen, PhD, in 2015.

⁵ This catalogue can be accessed online via <http://urn.fi/urn:nbn:fi:csc-kata20170811113955834443>.

4 RESULTS AND DISCUSSION

4.1 FROM FRAGMENTS TO A MORE COMPLETE PICTURE OF FINNISH STONE AGE EARTH GRAVES

4.1.1 EARTH GRAVES IN NUMBERS

The archival study revealed a total of 70 Stone Age earth grave sites (Appendix 1), located across all regions of mainland Finland except Lapland (Fig. 6) representing settlement site graves, cemeteries and solitary graves. The vast majority of sites are hunter-gather earth grave sites ($n = 53$), whilst the CWC tradition is represented at 17 sites (Appendix 1). Two sites (Jönsas and Kukkaroski I) yielded both hunter-gatherer and CWC graves. Whilst previous studies interpreted stray finds of ochre-stained artefacts or Corded Ware pottery vessels and battle axes as destroyed graves (e.g., Edgren 1959; 1966; 1970; Luho 1961; Halinen 1999; Nordqvist and Häkälä 2014), these ambiguous finds were not included in the analysis here. This is because the artefacts described above may also indicate votive deposits (Zagorska 2001, p. 114; Johansson 2006), and cannot thus be used alone to identify the presence of a grave. Accordingly, the map in Fig. 6 consists of only those sites with documented grave features with or without artefacts.

When earth graves are examined from the viewpoint of location, we find that most hunter-gatherer earth graves represent single graves located at settlement sites (Appendix 1). Typically, these graves lack artefacts or are furnished with only a few grave objects of non-perishable materials, although artefacts made of bone and wood might have been present at the time of interment. Beyond settlement sites, hunter-gather burials have also been situated at cemeteries (Appendix 1). Whilst some burials at these sites also lack grave objects, in many cases large amounts of artefacts were unearthed specifically from the cemetery burials (Appendix 1; Paper V). For example, many of the TCW cemetery burials in particular were furnished with rich assemblages of flint and amber objects (Paper V). Indeed, whilst flint and amber were also present in TCW settlement site burials, the amount of such materials is considerably smaller than that found in cemetery burials.

In contrast to hunter-gatherer earth graves, CWC graves are mainly solitary burials (Appendix 1). Beyond these specific burials, CWC graves have also been unearthed from a Corded Ware settlement site or from a previous Neolithic hunter-gatherer settlement site or cemetery. For example, the five graves of the Jönsas site (Appendix 1) — the only group of CWC graves known from the Finnish territory — were discovered from a possibly earlier hunter-gatherer cemetery of more than 20 ochre earth graves (Purhonen 1980; 1986; Paper IV).

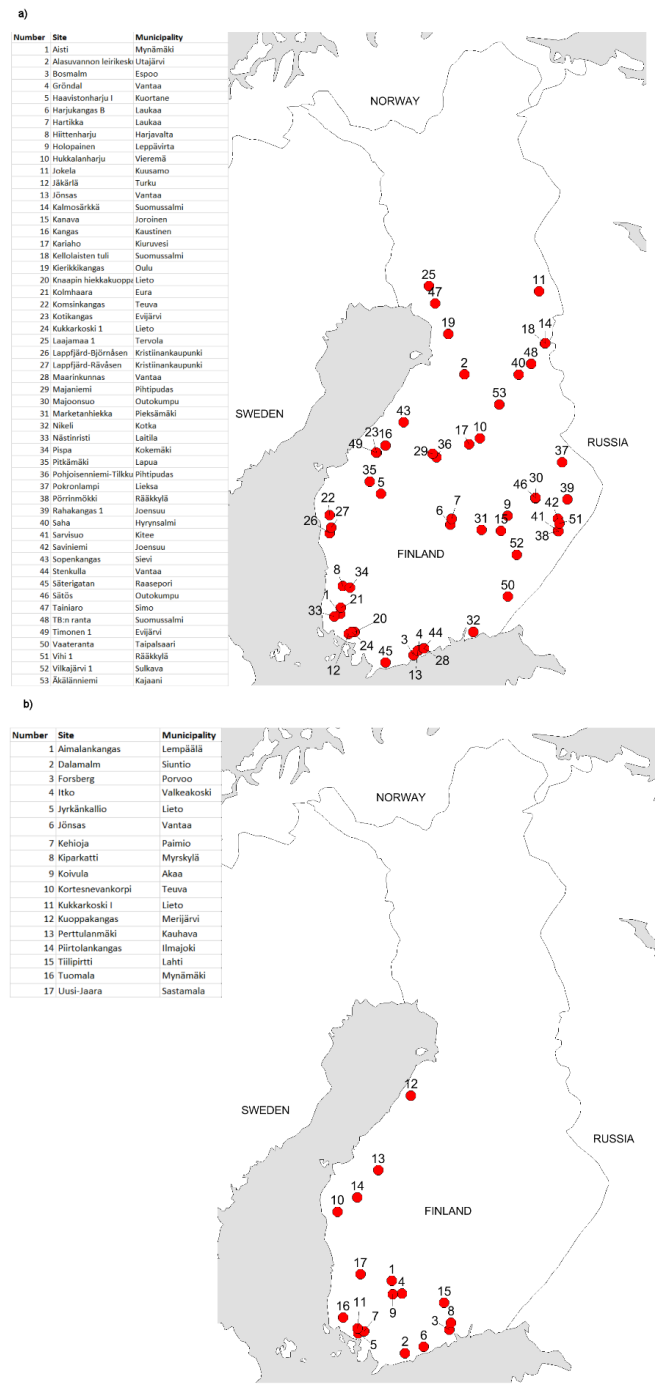


Figure 6. A) Distribution of hunter-gatherer earth graves in mainland Finland. B.) Distribution of CWC earth graves in mainland Finland. Maps: M. Ahola 2019.

4.1.2 DATING THE GRAVES

Based on the sparsely available radiocarbon determinations as well as relative datings relying on artefact typology (Appendix 1), the majority of the graves date to the Middle Neolithic period (Table 2), particularly the TCW and CWC periods. In this study, two new radiocarbon determinations from organic materials associated with Kolmhaara burial 1 and Kukkaroski 1 burial 9 were obtained (Table 3). Since both burials already contained artefact material typical for the period — namely, amber and flint objects (Kolmhaara burial 1) and Corded Ware pottery (Kukkaroski burial 9) — these determinations simply confirm the Middle Neolithic dating of those burials.

Period	cal BC	Amount of sites
Mesolithic	8850-5200	6
Early Neolithic	5200-3900	2
Middle Neolithic (Typical Comb Ware)	3900-3500	24
Middle Neolithic (Uskela Ware)	3750-3250	1
Middle Neolithic (Pölja Ware)	3250-2500	1
Middle Neolithic (Pyheensilta Ware)	3200-2400	1
Middle Neolithic (Corded Ware)	2800/2700-2300	17
Later part of Middle Neolithic	3600-2500	3
Undefined Neolithic	5200-2300	12
Unknown		5

Table 2. The number of known earth grave burial sites according to absolute and relative datings.

Unfortunately, the archival study did not reveal material suitable for radiocarbon determinations from any other burial. Thus, the number of graves with only a vague Neolithic date or an unknown date also remains high (Table 2). Given that the location of graves at multiperiod settlement sites possibly dating from the Mesolithic to the Metal periods (e.g., Purhonen and Ruonavaara 1994; Pesonen et al. 2014), some vaguely dated earth graves could also date to the Late Neolithic or even to the Metal periods. Indeed, a sporadic earth grave with ochre and a copper pearl as a sieve find was recently excavated from the Hangaskangas E site in northern Finland dating to ca. 2200 to 600 BC (Pesonen 2012). Whilst it was impossible to obtain a direct radiocarbon date from the grave feature itself, the location of the grave indicates the longevity of the earth grave tradition within the Finnish territory (Mökkönen 2013, p. 22)

Site	Dated material	Lab. no.	Uncal. BP	Calibrated date (68.2%)	Calibrated date (95.4%)	Median
Kolmhaara in Eura	Ochre-stained bark from Grave I	Hela-4082	4992±60	3940 (19.2%) 3870 calBC; 3810 (49%) 3700 calBC	3950 (94.4%) 3650 cal BC	3780 cal BC
Kukkarkoski I in Lieto	Wood charcoal from the grave structure of burial 9	Hela-4083	4181±60	2890 (15.4%) 2840 calBC; 2820 (52.8%) 2670 calBC	2900 (95.4%) 2580 calBC	2760 calBC

Table 3. Radiocarbon dates from Kolmhaara grave I and Kukkarkoski grave 9. The uncalibrated ^{14}C dates were calibrated using OxCal 4.2. Bronk Ramsey (2009) with atmospheric curve IntCal13 (Reimer et al. 2013).

In contrast to the large number of graves dating to the TCW and CWC periods, the earlier Mesolithic and Early Neolithic periods are represented by only a few burial sites (Table 2)⁶. Moreover, although these sites have been dated to the Mesolithic or Early Neolithic periods, the graves lack artefacts suitable for typological determination. Accordingly, aside from the Tainiara cemetery (Appendix 1), dating these sites relies on the location of the graves at Mesolithic or Early Neolithic settlements and, thus, cannot be considered reliable. Furthermore, whilst a radiocarbon determination is available from the Rahakangas 1 grave (Appendix 1), this date was obtained from charcoal collected from grave fill and, thus, is also not highly reliable. Finally, despite the Jönsas cemetery's identification as a Late Mesolithic site from ca. 7000 to 5500 BC (e.g., Purhonen 1980; Halinen 1999; Grünberg 2000; Leskinen and Pesonen 2008; Oshibkina 2008), no direct radiocarbon dates from any of the graves exist. Consequently, dating relies on the tradition of ochre use (Luho 1965; Purhonen 1980) and on the location of the graves in the Mesolithic occupation level of the site (Luho 1965, pp. 30–33). However, since the Jönsas site is a multiperiod site with phases of use from the Mesolithic to Neolithic and the Metal periods (Purhonen and Ruonavaara 1994), the Mesolithic date cannot be reliably determined in this case (for a more detailed discussion, see Paper IV). Consequently, in this thesis, the dating for the Jönsas ochre earth graves is listed as unknown (Appendix 1).

⁶ In Paper V, the site of Alasuvannon leirikeskus in Utajärvi was given a relative date to the Mesolithic period. Although no ceramics were unearthed from the site, the excavated material did not contain any specifically Mesolithic artefacts either. Consequently, in Appendix 1, the dating of the site has been listed as unknown.

Similar to Mesolithic and Early Neolithic graves, the graves succeeding TCW and preceding or coexisting with CWC also remain scarce (Table 2). However, the archival study revealed sporadic burials possibly typologically dated to the latter part of fourth millennium BC or to third millennium BC. Indeed, three burials (Appendix 1: Timonen 1, Lappfjärd-Rävåsen and Maarinkunnas) contained so-called v-perforated amber buttons. Since this artefact type appeared in the Finnish archaeological material during the latter part of the fourth millennium BC (Halinen 2015, p. 85), the presence of these buttons served to identify graves succeeding TCW graves. Graves succeeding the TCW period were also dated according to identifiable pottery. For example, asbestos-tempered pottery sherds, identified as Pöljä Ware, were discovered in the Majaniemi ochre earth graves (Paper V), thereby dating them to the third millennium BC. In addition, one identifiable rim sherd of Pyheensilta Ware together with around 25 unidentifiable pottery sherds were recovered from the fill of the Hiittenharju grave (Taskinen 1983; Paper V), also indicating a possible date to the third millennium BC (Taskinen 1983). Finally, the Uskela Ware pottery vessel discovered at Nästinristi grave 9 dates the grave to the mid-fourth millennium BC (Vikkula 1987; Edgren 2007, p. 514). We must keep in mind, however, that the artefacts placed in the grave could have been in circulation for several generations and, thus, the typology provides only a relative date for the burial.

We should also note that because both Mesolithic and Neolithic graves beyond Finnish territory were often furnished with bone and antler artefacts (e.g., Gurina 1956; Zagorskis 2004 [1987]; Lõhmus 2007; Piezonka et al. 2013), the high numbers of TCW and CWC graves could also derive from archaeological visibility. In fact, given the poor preservation of organic materials in the Finnish territory, graves furnished with artefacts made of these materials but without ochre could go unnoticed (Paper II; Paper V). For example, the Volosovo graves from the Russian territory along with Swedish Pitted Ware graves only rarely feature ochre, and, in many cases, the find materials primarily comprise artefacts made of organic materials (Burenhult 1997; Kostyleva and Utkin 2010; Piezonka et al. 2013). Thus, it seems reasonable to assume that the sporadic hunter-gatherer earth graves from the latter part of the fourth millennium BC or from the third millennium BC signify the rare occurrence of earth graves furnished with amber and ochre.

4.1.3 GRAVE STRUCTURES

Hunter-gatherer earth grave structures

Hunter-gatherer grave structures are shallow pits that, according to my previous research (Lappalainen 2007), were found at a depth of about 70 cm. In line with Mesolithic and Neolithic hunter-gatherer graves beyond Finnish borders (e.g., Lõhmus 2007, pp. 37–40), Finnish hunter-gatherer earth graves appear to follow the physical parameters of the body or bodies interred in the



Figure 7. A) Grave 1 from the Hartikka cemetery, central Finland, with two oval features of ochre side by side. Photographed from SE. Photo: M. Miettinen 1987, Finnish Heritage Agency. B) Graves 2 (individual burial) and 3 (multiple burial) from the Kangas burial site, central Ostrobothnia, photographed from N. Note the whetstone *in situ* in the middle ochre feature of grave 3. Photo: P. Halinen 1996, Finnish Heritage Agency.

grave, where the shape of the pit was either rectangular or oval. On average, the grave structures were roughly two metres long with a width of about one metre (Lappalainen 2007, p. 3). Thus, similar to hunter-gatherer graves in Scandinavia and the Baltic region, for instance, (Nilsson Stutz 2003, pp. 333–335; Tõrv 2016, p. 233), the dead appear to have been buried primarily in an extended position. However, some earth grave structures were also clearly larger with a width of about three metres (Lappalainen 2007, p. 3). In some cases, the distribution of ochre formed several oval features at the bottom of the pit (Fig. 7), and were thus interpreted as multiple burials of several individuals (Purhonen 1980; Miettinen 1992a; Halinen 1997).

As expected, most hunter-gatherer earth graves are so called ‘red ochre graves’ (Appendix 1). However, whilst ochre is present in most cases, its appearance varies. Indeed, although an intensive layer of ochre was discovered in some burials, ochre was clearly more sparsely used in others. For example, at the Jönsas cemetery, grave structures were often filled with ochre-stained soil (Purhonen 1980), whilst the TCW cemetery of Hartikka oval-shaped ochre features were revealed beneath stained soil fill (Fig. 8) (Miettinen 1992b, p. 29). In contrast to these features, in many graves succeeding TCW graves (Appendix 1: Nästinristi, Timonen 1, Lappfjärd-Rävåsen and Maarinkunnas), ochre is present only as small features or completely absent. Tentatively this might suggest a decreasing use of ochre during the Neolithic. However, graves at Hiittenharju and Majaniemi, dating to third millennium BC, nevertheless contained large amounts of ochre (Appendix 1).

Although ochre use varied, in the better-preserved hunter-gatherer graves of Scandinavia and the Baltics (Nilsson Stutz 2003; 2006), evidence of wrapping was observed relative to the position of the skeleton, and the skeleton was often surrounded by a layer of ochre possibly originating from an ochre-coloured body container (Nilsson Stutz 2006, p. 231). Indeed, examining the Finnish material from this perspective, inhumation-sized areas of intense ochre documented from the bottom layers of Finnish hunter-gatherer graves might actually represent the remains of an ochre-coloured wrapping (Paper I). Such an interpretation stems, for example, from the case of the Hartikka TCW cemetery burials in which the intensive ochre layer often narrowed at the other end (Miettinen 1992b, p. 29; Fig. 8). Similarly, the narrow but long grave structures could indicate a wrapped individual. Such burials exist, for instance, at the Kukkarkoski I cemetery, in which several burials measured only 40 to 50 cm wide with a length of about 200 cm (Paper I).

Occasionally, the graves were also connected to stone settings made of wood or natural stones (Appendix 1). For example, at the Nästinristi cemetery, large pieces of charred wood were discovered at the bottom of the grave pit (Vikkula 1987), suggesting the deceased was likely placed on wooden platforms to elevate the body from the pit floor. Indeed, a similar practice is also known, for example, from Mesolithic hunter-gatherer contexts in Scandinavia, where bodies or body parts were elevated from the floor of the grave using deer antlers, small stones and even a swan’s wing (Nilsson Stutz

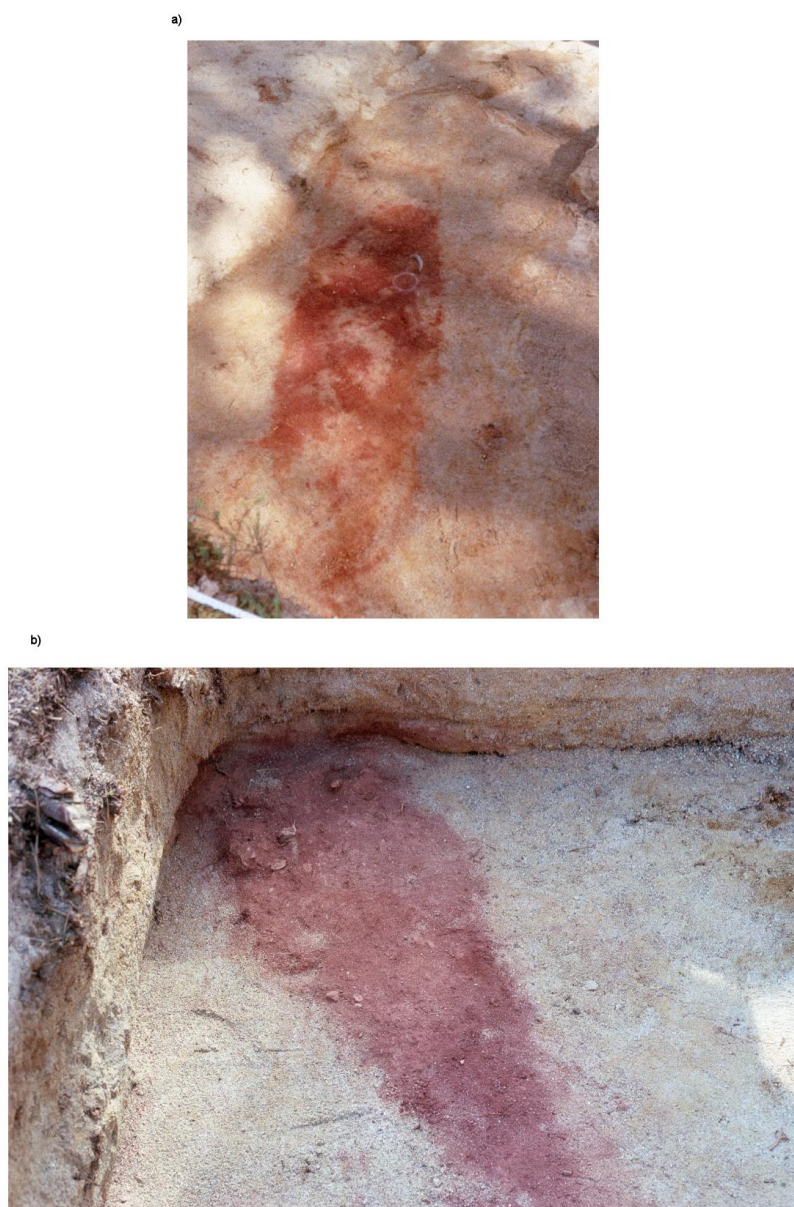


Figure 8. A) Oval burial feature from grave 5 from the Hartikka cemetery, central Finland, at a depth of about 60 cm. Note the metatuffite rings *in situ*. Photo: M. Miettinen 1988, Finnish Heritage Agency. B) Cone-shaped burial feature from grave 7 from the Hartikka cemetery. Photo: M. Miettinen 1988, Finnish Heritage Agency.

2003, p. 335). Since rows of small stones have also been found on the floor of several Finnish hunter-gatherer burials (Appendix 1; Paper I), these stones might have also functioned as platforms. Natural stones have, however, found other uses. For example, at the Jönsas cemetery, many grave structures were surrounded by water-polished natural stones (Fig. 9) or featured water-polished stones positioned in a linear formation along the axis of the grave feature (Purhonen 1980; Paper IV). Since these formations emerged just below the turf (Purhonen 1980, p. 12), they might have served as visible signs of the burials (Purhonen 1998, p. 29; see also Mökkönen 2013, p. 22).



Figure 9. Grave 18 from the Jönsas cemetery, southern Finland, surrounded by water-polished natural stones. Photo: L. Ruonavaara 1987, Finnish Heritage Agency.

In addition to inner structures made of wood and stone, fragments of bark have also been discovered in several hunter-gatherer earth graves (e.g., Edgren 1966, pp. 30, 43; Vikkula 1987, p. 10; Miettinen 1992b, pp. 29–30). For example, in Kolmhaara grave I, well-preserved ochre-stained bark was documented in several layers above the ochre layer, indicating that a bark wrapping or covering was used in the grave (Edgren 1984, p. 48; 2006, p. 328). A similar practice was also noted in a Neolithic context in Estonia. Indeed, at the Late Comb Ware cemetery of Tamula, a bark covering was discovered in burial XXII (Tõrv 2016, p. 250). In the Tamula XXII burial, the deceased was placed in a supine position with additional elevation behind the back of the corpse, and the burial was also possibly reopened after the initial internment (Tõrv 2015). Curiously, in Finnish hunter-gatherer graves, fragments of bark have been unearthed

solely from TCW cemetery burials (Paper V). This might suggest that the individuals buried in the cemeteries were treated differently than those buried in the settlement sites.

Corded Ware grave structures

Although most CWC earth grave structures were partly destroyed due to modern land use (Appendix 1), these graves are nevertheless larger structures indicating a crouched position (Edgren 1984, p. 76). According to the shape and size of the grave structures and objects (Appendix 1), most grave features appear to represent individual internments. The presence of a multiple burial has, however, been suggested for CWC grave I from the Jönsas cemetery in which two beakers were placed at opposite sides of the structure (Purhonen 1986, pp. 115–116). This interpretation is further supported by the large size of the feature and the form of the grave structure presumably constituting two oval burial features positioned side-by-side (Paper IV; Fig. 4).

In contrast to hunter-gatherer earth graves, ochre is not present in the CWC graves. Instead, the structures are oval or rectangular features of dark, sooty soil (Appendix 1). In a prior study, this phenomenon was explained as the use of fire as a part of the mortuary practice (Kivikoski 1934; Edgren 1958; Siiriäinen 1974), but no further analyses were conducted. In addition to sooty soil, the occasional presence of a wavy outline of the burial feature was also emphasised, together with hook-shaped formations at the corners, which led to the conclusion that some of the graves were furnished with animal skins (Äyräpää 1931, pp. 10–11; Torvinen 1979, pp. 42–43). Such features are present, for example, in the Perttulanmäki and Kukkarkoski 1 CWC graves (Appendix 1).

The Perttulanmäki grave was found by local farmers who discovered sherds of Corded Ware pottery together with a stone chisel and a fragmented adze from ‘black soil with the length of nearly two metres’ (Äyräpää 1931, p. 1). In August 1930, archaeologist Aarne Äyräpää conducted excavations at the site and revealed a partly preserved grave furnished with yet another stone adze and human molar enamel (Äyräpää 1931, p. 6). The grave structure consisted of a 2.25-cm-wide dark feature, rectangular in shape with a slightly wavy outline and hook-shaped formations at the SW and NE corners (Äyräpää 1931, pp. 4–5; Fig. 5). Based on the hook-shaped corners and the wavy outline of the feature, which were more suitable for a hide than for a wooden construction, Äyräpää interpreted the dark feature as a chamber-like construction made from two layers of animal skins tied to wooden poles at the outer corners (Äyräpää 1931, pp. 10–11).

To determine the nature of the dark feature, Äyräpää took soil samples from the feature and subjected them to chemical and microscopic analyses (Äyräpää 1931, p. 12). These analyses conducted using 1930s methods did not, however, verify Äyräpää’s interpretation of an animal skin. In this thesis, the soil samples collected from the dark feature during the 1930s excavations were re-analysed using modern microscopic analyses (Paper III). Remarkably, using SEM micrographs, we identified preserved Neolithic animal hairs from the

old samples. Whilst the mineralised fibres were poorly preserved and, thus, unsuitable for aDNA or mass spectrometer analyses, the animals hairs were nevertheless identified as belonging to a domestic goat.

The context of the samples from the dark, hide-like feature covering the walls and the floor of the pit suggests that the mineralised hairs likely originated from a goat skin placed in the grave as a part of the funerary ritual (Paper III). Whilst Åyräpää (1931, pp. 10–11) interpreted the feature as a chamber made of skins, the double feature of the hook-shaped corners could also represent the remains of several overlain hides or skins, where the skin was used to cover or to separate the dead from the floor of the pit. Although no further evidence for this was discovered, the grave might also have included a wooden chamber accompanying the goat skin. Moreover, the skins of additional animal species may also have been present (Paper III).

Moreover, whilst microarchaeological studies were not conducted at other sites, the possible presence of a wooden chamber has nevertheless been noted. For example, Edgren (1958, p. 31) surmised that the oval charcoal feature of the Forsberg grave (Appendix 1) could represent a chamber made of wooden planks placed in an upward position and covered with a lid. Although no human remains were discovered in the structure, the possible burial layer of the chamber contained two small Corded Ware beakers, one larger beaker and sherds from several other vessels (Edgren 1958, p. 29). Above the burial layer, the feature consisted of a 5-cm-thick layer of unstained sterile soil, above which laid another layer of sooty soil — the possible lid of the burial chamber. From this layer, a rim sherd of household pottery was discovered (Edgren 1958, p. 29).

Beyond the wooden chambers and animal skins, Finnish CWC graves also appear to associate with the use of natural stones (Appendix 1). For example, the Viikka earth grave might have been completely covered with stones, whilst, for example, a triangular-shaped stone was placed in the Dalamalm grave (Appendix 1). Given the wide variation present in Finnish CWC grave structures, clearly no single way of constructing an earth grave existed, however. Initially, the phenomenon might represent changes within mortuary practices over time. However, since CWC graves largely lack radiocarbon determinations, such interpretations remain difficult to verify. In fact, it is just as plausible that the variation reflects the varied origins amongst CWC immigrants (cf. Nordqvist 2016).

4.1.4 INDIVIDUALS BURIED GIVEN THE SPARSE HUMAN REMAINS

Whilst Finnish Stone earth graves are often understood as burials in which human remains have not been preserved, sporadic fragments of burnt and unburnt human bones have nevertheless been discovered from several sites (Appendix 1). As expected, the material was sparse and unburnt human bones in particular were extremely fragile consisting primarily of tooth enamel (Fig 10;

Paper II). However, when taken together and subjected to human osteological analysis (Paper II), new insight on the demography and mortuary practices of the Finnish Stone Age populations, for example, was gained.



Figure 10. Tooth enamel fragments from Vaateranta burial 2 *in situ*. Photo: K. Katiskoski 1997, Finnish Heritage Agency.

In mainland Finland, identifiable human remains from Stone Age earth grave contexts have been discovered at nine sites (Aisti, Hartikka, Kanava, Kolmhaara, Kukkarkoski 1, Lappfjärd-Björnåsen, Perttulanmäki, Rahakangas 1 and Vaateranta). Most sites consist of TCW earth graves (Appendix 1), but one possible Mesolithic grave (Rahakangas 1) and one CWC grave (Perttulanmäki) were also identified. The low amount of CWC human remains is surprising, since CWC graves follow hunter-gatherer earth graves. However, it may be that organic remains preserve better in iron-rich ochre (e.g., Salomon 2009, pp. 101–102). Since the CWC graves lack ochre, the preservation of human remains could indeed be poorer. In fact, this hypothesis is further supported by the Perttulanmäki grave situated within iron-rich soil (Äyräpää 1931, p. 12). Indeed, this natural occurrence could have positively influenced the preservation of organic materials in this particular grave.

The human remains unearthed from Finnish Stone Age earth graves belong to at least 21 individuals, 18 of whom received an inhumation burial, whilst at least 4 individuals were cremated and buried collectively (Paper II; see also Lahti 2003). We must note, however, that some of the bones (namely, the Kanava and Kolmhaara cist grave materials) derive from contexts with a Stone



Figure 11. Stone cist grave XI from the Kolmhaara cemetery, western Finland. Photo: T. Edgren 1960, Finnish Heritage Agency.

Age-type grave structure, but with an AMS date from a younger period (Appendix 1). Whilst the AMS date from the Kanava grave — a combined sample consisting of four individuals (Appendix 1) — is most likely biased (Paper II), the Kolmhaara cist graves (Fig. 11) represent a trickier case. Indeed, when the Kolmhaara cist graves

were first unearthed, they were dated to the Early Neolithic based on the earliest use of the nearby settlement site (Edgren 1966, p. 96). However, in the

late 1990s, two cist graves, located just six metres from each other (Edgren 1966, p. 28), were AMS dated to the Bronze Age and the Middle Iron Age, respectively. This result was surprising given that some Bronze Age pottery had been discovered at the site, although no Iron Age artefacts were found (Edgren 1999, pp. 319–324). Whilst the reliability of these dates has been questioned (Edgren 1999; Mökkönen 2013), the graves could nevertheless represent a continuity of funerary practices from the Stone Age to the Metal periods. Accordingly, the total amount of Stone Age human remains might be even smaller.

Since the human remains consisted primarily of small fragments of enamel, age groups used by skeletal biologists (e.g., Scheuer and Black 2000, pp. 468–469) could not be applied and the individuals were classified only as adults (individuals with full skeletal development) or subadults (the presence of milk teeth and unerupted teeth) (Paper II). According to these tentative age estimations, eight of the individuals died as subadults and eight as adults suggesting that both adults and subadults were buried in the earth graves. Moreover, since unerupted teeth or milk teeth were occasionally discovered together with teeth showing heavy attrition (e.g., Lahti 2003, p. 124; 2004), it appears as though adults and subadults were also buried together. For example, at Vaat-eranta cemetery grave 14, an unerupted deciduous molar was discovered together with a molar showing signs of heavy wear, suggesting the presence of an adult and a subadult in the same burial site (Lahti 2003, p. 124). Similarly, from Kanava grave 2, teeth with heavy attrition were unearthed together with milk teeth (Lahti 2004). Although the individuals could not be aged more precisely, these discoveries agree with better-preserved contemporary burial sites beyond Finnish borders from which burials of adults, juveniles and children have been unearthed (e.g., Zarina 2006; Tõrv 2016, pp. 149–150). Moreover, similar to the Finnish material, at these burial sites small children were

also often buried with adults (e.g., Larsson 1989; Zagorskis 2004 [1989]; Fahlander 2012; Brinch Petersen 2015).

4.1.5 THE MATERIAL CULTURE OF DEATH: CLEAR PATTERNS OBSERVED

The hunter-gatherer material culture of death

Although objects made of perishable materials are poorly preserved, the Finnish Stone Age hunter-gatherer graves nevertheless contain large numbers of objects made of non-perishable materials, such as stone, amber and ceramics. According to the dating of these burial sites, most finds originate from the early fourth millennium BC TCW period, whereas only around 10 per cent date to the preceding and succeeding periods (Paper V). In contrast to the richly equipped TCW burials, the small number of finds dating from the Mesolithic and Early Neolithic periods also consisted primarily of quartz or slate flakes. Interestingly, the few stone artefacts from the burials dated to these periods were discovered as preforms (Paper V). Similarly, the burials dating to the later part of the fourth millennium BC or to the third millennium BC also contained fewer finds, namely, ceramics or single amber objects (Paper V). Given the lack of find material suitable for typological or radiocarbon dating, only as much as 20 per cent of the finds roughly dated to the Neolithic period or remained impossible to date.



Figure 12. Flint and amber objects from hunter-gatherer graves associated with Typical Comb Ware. Flint objects from Kolmhaara graves I and XIV, an amber pendant from Kangas burial 1, and an amber ring from Lappfjärd-Björnåsen burial 1. Photo: M. Ahola 2016.

In accordance with previous studies (e.g., Edgren 1966; 1984; 2007; Torvinen 1979; Miettinen 1992a-b; Halinen 1997; 1999; 2015), typical finds from the TCW burials include both amber jewellery and flint projectile points (Paper V; Figs. 2 and 12). Flint projectile points have been discovered from both the burial layer and the grave fill, whilst almost all amber artefacts were recovered from the burial layers (Paper V). This observation agrees with amber finds from better-preserved burial sites beyond Finnish borders, suggesting that amber artefacts served as ornaments (e.g., Jaanits 1957; Zagorskis 2004 [1989]; Zagorska 2001; Butrimas 2012; Piezonka et al. 2013). Some amber rings or pearls were discovered in pairs, and occasionally together with lumps of ochre-mixed clay, possibly indicating a tradition in which the face of the deceased was covered with clay, whilst amber objects were placed over the eyes (Edgren 2006). Indeed, this tradition is also found in Comb Ware graves from the Mesolithic–Neolithic cemetery of Zvejnieki in northern Latvia (Zagorskis 2004 [1987]; Zagorska 2001; Nilsson Stutz et al. 2013). In the Finnish material, however, unburnt clay has occasionally been found near fragments of tooth enamel without amber objects (Paper V). This phenomenon suggests that the face of the deceased was covered only with clay or that ornaments made from perishable materials rather than amber were used. However, even if the amber and flint objects represent the commonly emphasised finds from the TCW graves, the most common finds from these graves are flint and quartz flakes and pottery sherds. Furthermore, even if the preservation of organic materials is typically poor, TCW grave finds also include small amounts of bark, resin and wood, as well as two small bone figurines. Curiously, complete pottery vessels have been discovered only at four graves, whilst the total number of TCW graves with grave finds extends to over 70 (Paper V).

Although most of the finds derive from TCW burials, certain common trends in the hunter-gatherer material culture of death can be observed. First, stone flakes, often overlooked, were commonly discovered from burials dating to all periods (Paper V). These flakes were often discovered in the fill of the grave structure, but since they were also discovered in small heaps in the burial layer, their use was clearly intentional (cf. Edgren 1959; 2007). Second, axes, adzes and pottery were not generally placed in the graves (Paper V). Third, as noted by Edgren (1982, p. 58; 2007, p. 512), in many cases the pottery found in Finnish Stone Age hunter-gatherer earth graves is somewhat anomalous, consisting, for instance, of vessel bases or miniature or partial vessels. Amongst these, only miniature vessels were found intact, placed either upside down or in an upright position, whereas the larger vessels or vessel bases were found as articulated sherds (Paper V). Curiously, a similar practice was observed amongst the Neolithic Pitted Ware population of the Swedish territory (Larsson 2009a-b). Indeed, although large amounts of pottery were deposited in the Pitted Ware settlement sites, pottery vessels remain rare in Pitted Ware graves (Larsson 2009b, 251). Moreover, the rare vessels deposited in the graves tend to consist of sherds of partial vessels, bases or miniature vessels

placed upside down (Larsson 2009b, p. 252). Thus, a certain uniformity characterises the ways in which Neolithic hunter-gatherer populations of the Baltic area used, and did not use, pottery in their mortuary practices.

Although pottery vessels rarely feature in hunter-gatherer earth graves, pottery sherds were commonly found in the fill of Neolithic hunter-gatherer graves (Paper V). However, similar to stone flakes, these sherds — particularly rim sherds — were also deliberately placed in the burial layer around, for example, the head area of the deceased or on rare occasions used to line the walls of the grave (Katiskoski 1999, p. 9; Wickholm 2001, p. 6). Indeed, this phenomenon suggests that intact pottery vessels or vessel halves were considered significant, as well as vessel shards. In this context, rim shards in particular seem to have been considered somewhat special.

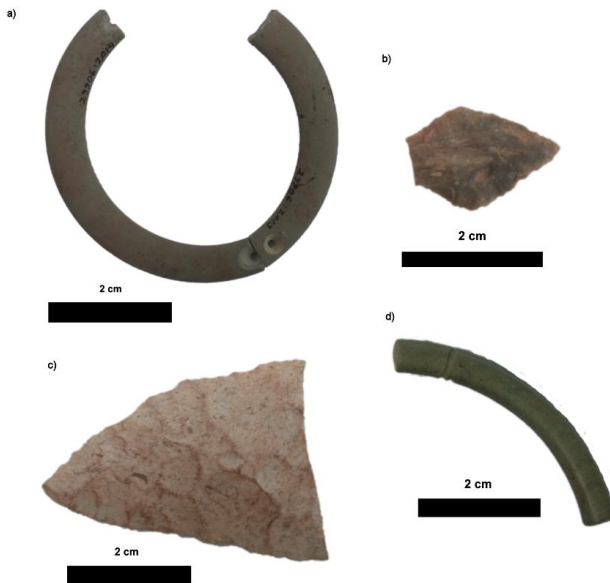


Figure 13. Partial flint and metatuffite objects from hunter-gatherer graves associated with Typical Comb Ware. A) Partial metatuffite ring from Kangas burial 3. B) Fragmented flint projectile point from Hartikka burial 6a. C) Partial flint artefact from Kukkaroski I grave 10. The other half of the object was discovered in Kukkaroski I grave 1. D) Partial metatuffite ring from Laajamaa 1 grave 5. Photo: M. Ahola 2019.

Remarkably, many of the grave finds were also fragmented or partial. For example, the tips of flint projectile points were broken or only a half of a point was placed in the grave. Similarly, some amber and metatuffite ornaments clearly represented partial objects (Fig. 13). Although this phenomenon was observed solely with the naked eye whereby items were not subjected to any

further analysis, at the Kukkarkoski I cemetery, two halves from the same flint projectile point were placed in two different burials, suggesting that the practice of fragmenting was intentional (Paper I).

The Corded Ware material culture of death

Although CWC grave structures show evidence of variation, the material culture in the graves is rather uniform. Indeed, similar to continental CWC burials (e.g., Furholt 2014, Fig. 2), Finnish graves are also furnished with ground-stone battle axes, stone adzes and CWC pottery vessels (Appendix 1). With the exception of the Forsberg grave, in which household pottery was placed at the lid of what is considered the burial chamber (Edgren 1958, p. 29), the CWC grave objects seem to derive from the burial layer. For example, at the Pertulanmäki grave, an adze was discovered together with a human molar enamel at a depth of about 70 cm, suggesting that this represents the burial layer of the grave (Äyräpää 1931, p. 6). The other artefacts in the grave — sherds from a CWC beaker and another stone adze — represented stray finds prior to excavation (Äyräpää 1931, p. 1).



Figure 14. Corded Ware pottery vessels from the Gröndal 1 (centre) and Jönsas burial sites in Vantaa, southern Finland. Photo: István Bolgár 2008, Finnish Heritage Agency.

Similar to the Perttulanmäki finds, most Finnish CWC pottery vessels associated with graves have been discovered as shards. Thus, the positioning of the beakers remains largely unknown. In better-preserved contexts, researchers noted that vessels have been placed both in an upward position as well as upside down. For example, most of the Jönsas vessels (Fig. 14) were discovered in an upward position (Purhonen 1986), whilst one of the smaller beakers from the Forsberg grave was intentionally placed upside down (Edgren 1958, p. 29). Curiously, the practice of placing a small vessel upside down mimics a hunter-gatherer mortuary practice. Although how far this phenomenon extends is unknown, it is noteworthy that in the Forsberg grave rim shards of household pottery were also used as grave objects (Edgren 1958, p. 29). Indeed, this practice also has counterparts in the hunter-gatherer material culture of death. Accordingly, it may be that, occasionally, grave objects were treated similarly within hunter-gatherer and CWC contexts.

Whilst sporadic connections might exist, it is nevertheless clear that the CWC graves differ from the hunter-gatherer material culture of death. Indeed, at least in the Finnish territory, the use of axes, adzes and pottery vessels as common burial gifts clearly contrasts with hunter-gatherer graves in which the artefacts mentioned are only rarely encountered (Paper I; Paper V). This, on the other hand, suggests the presence of a new material culture of death, heavily underlining a distinguishable identity of the deceased (Paper III). Indeed, according to Larsson (2009a, p. 354), this distinguishable identity — as member of the CWC community — was commonly expressed within CWC mortuary practices by orienting the body in a proper way and providing the dead with the correct set of accompanying burial gifts. Since this correct set of burial gifts clearly contrasted the earlier hunter-gatherer tradition, it may be that the people identifying themselves as part of the so-called CWC community wanted to set themselves apart from hunter-gatherer populations.

This phenomenon of a distinguishable identity, given other novel practices appearing in the archaeological evidence during the CWC period, provides us with further insights. Indeed, whilst no preserved domestic animal bones dating to the Corded Ware period have been discovered in Finland thus far (Bläuer and Kantanen 2013), the location of many CWC settlement sites from locations suitable for farming as well as at old phosphate-rich dwelling sites of earlier hunter-gatherer populations suggests that the CWC people from the Finnish territory also relied on pastoral farming (Äyräpää 1939, p. 118; Edgren 1984, p. 75). This interpretation has recently been further supported by lipid analyses conducted on Finnish Corded Ware pottery (Cramp et al. 2014), which confirmed the presence of milk fats originating from domestic stock. Hence, it may be that the identity emphasised in CWC mortuary practices associates with a pastoral farming community.

Given the spread of agriculture, the appearance of a new food economy may be deeply intertwined with new ritualised values (Anthony 2007, pp. 160–161). Accordingly, in CWC burial contexts, those new ritualised values might have

been practiced, whereby the appropriate set of burial gifts also included domestic animals, such as the Perttulanmäki goatskin (Paper III). Furthermore, because several Corded Ware burials of the Baltic area were furnished with bone artefacts made from domestic animal bones (Zagorska 2006, p. 103; Lõugas et al. 2007, pp. 25–26; Larsson 2009a, p. 63), animal companions could be present in various forms. In addition, this idea is further supported by the fact that all milk residues from Finnish Corded Ware pottery were found exclusively in beaker-type ‘drinking’ vessels (Cramp et al. 2014, p. 4). Because these beakers are typically found in grave deposits (Edgren 1970, pp. 76–77; Larsson 2009a, pp. 352), the animal might also have been represented by placing milk or a vessel associated with milk in the grave.

4.2 STONE AGE MORTUARY PRACTICES WITHIN FINNISH TERRITORY

4.2.1 HUNTER-GATHERER MORTUARY PRACTICES IN EARTH GRAVES

Based on the data presented in the previous section of this chapter, the hunter-gatherer mortuary ritual was a complex set of practices in which both adults and subadults were buried underground either individually or collectively. In general, these people were inhumed; occasionally, however, they also might have been cremated. Before placing the deceased in the grave, the burial pit was carefully prepared; it might have contained inner structures of wood and stone, and, on rare occasions, the walls of the grave were lined with rim sherds from pottery vessels. Occasionally, the dead body appears to have been wrapped or placed in or on a soft container made of materials such as bark. In TCW cemetery burials, the face of the deceased was sometimes covered with ochre-stained clay, whilst amber pendants or buttons were possibly placed over the eyes. The body of the deceased was also possibly elevated from the floor of the grave using small stones.

In many cases, ochre was used to dye either the wrapping or possibly the burial pit. In addition, objects clearly packed with meaning were placed in the grave. Since certain artefacts, such as axes, adzes and pottery vessels, were only rarely used, certain rules concerning burial gifts seem to have existed. Indeed, since a similar pattern was also noted at the Zvejnieki cemetery where only 4 of the more than 300 hunter-gatherer graves were furnished with an axe or an adze, and pottery vessels were discovered in just 5 graves (Zagorskis 2004 [1987], Appendix 1), the practice of rare pottery or axe deposition in graves appears intentional. Accordingly, the Stone Age hunter-gatherer populations of the Finnish territory did not bury their dead in ‘simple pit graves’. Rather, hunter-gatherer earth graves represent the end product of mortuary

practices in which dead bodies, burial objects and grave pits were prepared with care. Accordingly, these structures are only seemingly simple.

Aside from the grave structures, objects and individuals buried, the complexity of hunter-gatherer funerary customs also emerge from the spatial distribution of graves within a cemetery. Indeed, whereas Mesolithic graves from places such as southern Scandinavia do not cut into each other (Nilsson Stutz 2004; Gummesson and Molin 2016), the Middle Neolithic graves discovered in neighbouring areas in Finland are at times intentionally positioned amongst older burials (e.g., Andersson 2004; Nilsson Stutz 2010a; Papers I and IV). For example, at the Ajvide cemetery in Gotland, new burials were placed vertically towards old burials, with the skulls of the old burials removed, positioning the head end of the new burial there instead (Andersson 2004). A slightly different practice existed at the Zvejnieki cemetery, where new burials were dug through older burials (Nilsson Stutz et al. 2013; Larsson 2017). Indeed, as Larsson explains (2017, p. 342), the people burying their dead in the Zvejnieki cemetery clearly knew that old burials existed. Nevertheless, digging a new grave continued and the skeletal remains discovered were either pushed aside or included in the fill of the new grave.

Within the Finnish territory, a similar practice can be observed at the Jönsas and Kukarkoski 1 cemeteries (Papers I and IV). For example, at the Kukarkoski 1 TCW cemetery, several burials were positioned over a richly equipped grave structure (burial 1a) (Paper I). This burial was dug deeper and larger than any other graves from the Kukarkoski cemetery and was accompanied by about 50 amber pendants in various shapes (one of which was anthropomorphic), six flint blades, a fragmented flint sculpture, a stone mace, two fragmented slate rings, a slate knife, a grinding stone, a ceramic vessel base and several flint and quartz flakes (Torvinen 1979). Indeed, even within the TCW context, this burial was exceptionally rich, suggesting that the burial was somehow special. Since new burials were intentionally positioned on top of the burial, the grave seemingly continued to hold some special value even after the primary funerary rite (Paper I).

Although a similar special burial cannot be noted at the Jönsas cemetery, the practice of placing new burials amongst older ones can be observed at several burials (Paper IV). For example, Jönsas grave 6 — previously interpreted as one large grave structure (Ruonavaara 1988, pp. 19–20) — appears to represent at least three partially overlapping graves (Paper IV). Similarly, graves 10 and 11 also clearly partially overlap (Seger 1986, p. 7). Curiously, since Mesolithic graves do not tend to cut into each other, the presence of this phenomenon could, in fact, suggest at least a Neolithic date for hunter-gatherer graves that cut into each other. This does not, however, rule out the possibility that some hunter-gatherer graves of the site could also date to the preceding or subsequent periods.

4.2.2 CONTINUITY AND CHANGES IN HUNTER-GATHERER EARTH GRAVE MORTUARY PRACTICES

Whilst Finnish Stone Age hunter-gatherer burials continued the long-lasting earth grave tradition, clear differences emerged in their material culture. According to the material available, the first big shift can be noted in the early fourth millennium BC when TCW burials appeared in the archaeological evidence. Although these burials clearly continued the Mesolithic core practices of the Baltic area and Scandinavia in, for example, the use of ochre, wrappings and soft containers (e.g., Nilsson Stutz 2006; Tõrv 2016; Paper I), they differ from prior burials with a specific material culture of death in which the use of flint and amber was clearly considered important (Paper I and V). Furthermore, since most hunter-gatherer earth graves, grave objects and cemeteries also date to the TCW period (Table 2; Appendix 1), it seems that this period could also represent a time during which cemeteries, earth graves and the use of non-perishable grave goods became increasingly more common (Paper V).

Since most of the Finnish Stone Age hunter-gatherer earth graves date to the TCW period, the Finnish material specifically explains the TCW mortuary practices. However, since the Comb Ware mortuary practices of the Baltic area represented a continuity of the core Mesolithic practices (Nilsson Stutz 2006; 2010; Tõrv 2016), some traditions recorded from TCW graves could have also existed during the Finnish Mesolithic. Since the tradition of furnishing inhumation burial graves with ochre continued amongst hunter-gatherer populations in the Finnish territory until the third millennium BC (Paper V), the core mortuary practices appear to exist even after the TCW period, thus also co-existing with CWC traditions.

However, even if the core mortuary practices continued after the mid-fourth millennium BC, the number of earth graves and cemeteries appears to decrease again (Paper V). This might also suggest another gradual change in funerary practices. Furthermore, since the number of known grave objects from the period remains scarce, the shift occurred again in the material culture specific to death. Indeed, whilst amber continues to appear in the form of v-perforated amber buttons, amber items are clearly no longer used as much. Rather than using non-perishable materials, these burials contained items made of, for example, bone and antler instead.

4.2.3 THE MULTIPLICITY OF HUNTER-GATHERER MORTUARY PRACTICES

Observing hunter-gatherer mortuary practices solely from the viewpoint of earth graves does not provide a complete picture, however. Indeed, the number of graves does not equal the number of coeval settlement sites (Huurre 1998, pp. 270–271). Whilst this might result from a research bias — all burial sites have not yet been discovered or completely excavated — the number of known graves is so small and from such a long period of time that a multiplicity

of mortuary practices must have co-existed. In fact, the multiplicity of funerary practices can already be seen within known inhumations placed either at settlement sites or in cemeteries (Appendix 1). During the TCW period, individuals buried in cemeteries also received more grave goods and were more often associated with evidence of body handling (e.g., fragments of bark or unburnt clay tempered with ochre), suggesting that these individuals were treated differently from those buried at settlement sites (Paper V). In other words, individuals were buried in various ways even within the earth grave tradition.

Although Stone Age human remains remain scarce in Finland, the multiplicity of mortuary practices can also be observed, for example, in the only cremation burial site dated to the TCW period, discovered at the Vaateranta cemetery (eastern Finland) (Räty 1995; Katiskoski 2003). This burial consisted of cremains from at least four individuals burned at a low temperature (Lahti 2003; Paper II). The cremains were buried within an inhumation cemetery from the same period and, similar to the inhumations, were placed in a pit filled with ochre (Katiskoski 2003). Although no further cremation earth graves are known, fragments of burnt human bones have been sporadically discovered at Mesolithic and Neolithic settlements (Koivisto 2010, p. 16 and references therein). Although most of these bone fragments have not been AMS dated, several fragments of a burnt human skull, with mandible, wrist, finger and toe bones from a single individual were recently discovered amongst burnt animal bone material from the Hommas settlement site (southern Finland) and dated to the Late Mesolithic (Koivisto 2010).

The Hommas discovery suggests that the so-called loose human bone phenomenon (see Chapter 2.2, above) is also present in the Finnish material, albeit not as clearly as in Danish materials for example (cf. Brinch Petersen 2016). Similar to Stone Age sites beyond the Finnish border (Meiklejohn 2017), the Hommas bones were nevertheless discovered within the settlement site debris, indicative of the presence of unknown mortuary rituals or post-mortal manipulation. For example, Sørensen (2016) suggested that loose human bones could represent the material remains of an air burial, whilst Brinch Petersen (2016) proposed the idea of a skull cult. However, considering the context of the finds amongst settlement site debris, Nilsson Stutz (2014, p. 722) wondered whether the loose human bones could also represent a mortuary practice in which some – or even most – individuals were treated in a fashion similar to the treatment of hunted animals. Indeed, if we observe how hunter-gatherer societies of the circumpolar North have treated the bones and carcasses of hunted animals, it seems that in order to ensure the revival of the animal population, the bones needed to be deposited in a specific way (Jordan 2003, pp. 100-102 and references therein). If a similar ideology applied to Stone Age populations, it seems that the correct way to deposit animal bones was to scatter the bones – or parts of the bones – around the settlement sites (e.g., Ukkonen 1999). From this perspective, the presence of human bones amongst this material is no longer strange. Rather, it indeed seems plausible

that the mortuary practice was conducted in order to revive the individual (or human population) in a manner similar to hunted animals.

Although speculative, this idea could be further supported by folkloric sources. Finnish folklore provides several parallel concepts for the abode of the dead relating either to the realm of the dead located far away in the north (in Finnish, *Tuonela*, *Pohjola* and *Hiitola*) or to a dwelling situated underground (in Finnish, *Manala*) (Siikala 2002, p. 125). Simultaneously, a heavenly or celestial realm of the dead — the upper-most layer of the three-tiered world — could also have existed (Siikala 2002, p. 128). Whilst impossible to determine whether the Stone Age people shared the same belief, the idea is intriguing from the perspective of the multiplicity of funerary practices. What if the differing ways of handling the dead body relate to the multiplicity of the realms of the dead? Indeed, several researchers have already suggested that those Stone Age hunter-gatherers buried underground were somehow special — either special individuals such as shamans (e.g., Gurina 1956; Edgren 1966; O’Shea and Zvelebil 1984) or feared and rejected outcasts of society (Strassburg 2000). Perhaps this special segment of the population was thought to end up in an underground abode of the dead, whilst most of the population, buried in another manner, travelled to another place or back to the living.

4.2.4 CORDED WARE MORTUARY PRACTICES AND THE CONNECTION TO HUNTER-GATHERER FUNERARY TRADITIONS

Whilst the number of known CWC earth graves in mainland Finland is considerably smaller than the number of Stone Age hunter-gatherer graves (Appendix 1), some insights into CWC mortuary practices can nevertheless be gained. First, when we compare CWC graves to hunter-gatherer graves, we find that these two earth grave traditions clearly differ in their material culture. Indeed, furnished with ground-stone battle axes, adzes and Corded Ware pottery vessels — the same objects rarely found in hunter-gatherer graves — Finnish CWC graves appear to continue the material culture of death found in Continental Europe during the third millennium BC. Second, the size of the graves suggests that the dead were most likely buried in a crouched position, and, third, ochre was no longer central to the funerary practice. Thus, these factors suggest that CWC graves represent a novel funerary practice. Given the burial objects made from or associated with domestic animals, it may be that through these novel practices the CWC people wished to emphasise an identity related to a pastoral farming community.

However, whilst CWC mortuary practices clearly differ from the hunter-gatherer tradition, echoes of past practices also emerge. For example, despite the larger size and more monumental inner structures of the CWC graves, the dead were nevertheless still buried underground. Furthermore, taking the example of the Forsberg grave, pottery vessels and sherds were treated in

a manner quite similar to the treatment of such items within hunter-gatherer mortuary practices (see Chapter 4.1.5, above). Finally, within the Finnish territory where only a handful of CWC inhumation graves are known (Appendix 1), a multiplicity of funerary practices could have existed. We must note that no loose human bones dated to the CWC period have been found, however. Moreover, a large number of battle axes have been discovered within the Finnish territory (Nordqvist and Häkälä 2014, pp. 12–15); whilst their original context remains unclear, they could also originate from destroyed graves.

Although evidence of hunter-gatherer mortuary practices within the Finnish CWC funerary tradition remains rather weak, the presence of a hunter-gatherer component is not unexpected. Indeed, according to several scholars, the CWC phenomenon resulted from the extensive networks to which the local populations also contributed (Lõugas et al. 2007; Vander Linden 2007; Larsson 2009a; Furholt 2014; Nordqvist and Häkälä 2014), for example, through exogamy (Sjögren et al. 2017; Holmqvist et al. 2018). As a result, local burial idiosyncrasies were overlain by the enactment of novel funerary practices (Vander Linden 2007, p. 185). In other words, the core mortuary practices of the local populations might have continued, such as in how the body was handled and the grave constructed, even if the material culture of death changed.

The idea of continuity in the interaction network amongst local practices is further supported by the fact that CWC graves have occasionally been discovered in the same cemeteries as hunter-gatherer graves (Papers I and V). As noted in above (see Chapter 2.3.2), this continuity is present in, for example, the large hunter-gatherer cemeteries of the Baltic area (Zagorskis 2004 [1989]; Butrimas 2012) and can be seen in sporadic sites across Continental Europe (Jeunesse 2013). Whilst sporadic, this phenomenon suggests that the CWC people not only knew the location of hunter-gatherer cemeteries, but the use or reuse of these sites also formed a part of the CWC mortuary repertoire.

Within the Finnish territory, CWC graves have been unearthed from cemeteries at Jönsas and Kukkarkoski I (Fig. 15). Since the dating of the Jönsas hunter-gatherer graves remains unknown, we cannot reliably conclude that the CWC graves were coeval with the hunter-gatherer cemetery or represent the reuse of an old cemetery (Paper IV). However, since the sherds of a Corded Ware vessel was discovered from the stone setting of a Jönsas hunter-gatherer grave (Purhonen 1980, p. 14), hunter-gatherer graves are not, at least, a later phenomenon than the CWC graves. Although prior research interpreted the presence of the vessel sherds as an accidental inclusion caused by frost (Purhonen 1980, p. 14), given the above explanation regarding interaction networks, these sherds might also indicate a votive deposit intentionally placed on the older grave (Ahola 2016, p. 189). By contrast, this



Figure 15. A) Site plan from the Kukkarikoski 1 cemetery showing the locations of hunter-gatherer and Corded Ware graves. Drawing by M. Ahola 2015 (based on Torvinen 1979, 39 and Torvinen 1980b, Appendix 24). B) Site plan from the Jönsas cemetery showing the distribution of hunter-gatherer and Corded Ware graves. Drawing by M. Ahola (based on Purhonen & Ruonavaara 1994, 90).

suggests that the CWC people appreciated the dead buried in these cemeteries. Indeed, since as many as five CWC graves were also dug in the Jönsas cemetery, the CWC people must have considered the site significant in some way (Paper IV).

In contrast to the Jönsas cemetery, the radiocarbon determinations obtained from the Kukkarikoski I CWC grave suggest a younger date for the CWC burial than for the TCW burials (Appendix 1; Table 3). Although the dated material consists of wood charcoal, the dating nevertheless agrees with the typological dating of the grave, suggesting that the Kukkarikoski 1 cemetery was reused by the CWC people (Paper I). Indicating a similar appreciation towards the older graves similar to the case of Jönsas, the Kukkarikoski I CWC grave does not intersect any of the previous graves. Rather, the grave is situated directly next to the TCW burials (Fig. 15a). In this sense, it seems likely that the CWC people knew where the older graves were located, a knowledge plausibly gained from the local populations.

4.3 STONE AGE COSMOLOGY GIVEN BURIAL SITES AND MORTUARY PRACTICES

4.3.1 CONNECTING TO PREVIOUS GENERATIONS

After exploring Stone Age mortuary practices, it is time to see what these practices endode of Stone Age cosmology. Starting from the role of buried individuals or past generations within this worldview, it can be stated that the continuously used cemetery sites were important locations for Stone Age communities (e.g., Borić 1999; Nilsson Stutz 2014; Brinch Petersen 2015). Used for several generations, cemeteries were situated at locations to which people repeatedly returned to bury their dead. It seems, however, that only certain individuals were buried at these sites. Indeed, given the total number of unearthed burials at the Zvejnieki cemetery (~300; Zagorskis 2004 [1989]; Nilsson Stutz et al. 2013) and comparing that to the time of use covering thousands of years (Zagorska 2006), it is clear that people were buried at this site only rarely (Larsson 2017, p. 342). Since cemeteries bear evidence of, for instance, hoards or votive deposits (Zagorska 2001, p. 114; Kostyleva and Utkin 2010, pp. 49–50) and fire places (e.g., Torvinen 1979, p. 52; Vikkula 1987, pp. 8–12; Butrimas 2012, pp. 190–193), other ritual activities, possibly relating to commemoration, also took place at these sites. Accordingly, these sites worked as ‘sites of memory’ – that is, places in which social memory was recalled and passed on (cf. Zerubavel 2003, p. 6). During this process, the site might have been recreated with several new meanings and stories concluding at the birth of a ‘mythical place’ or ‘ancestral site’ (Paper IV; see also Olivier 2011).

Whilst Finnish hunter-gatherer cemeteries are considerably smaller than, for example, the Zvejnieki cemetery, they nevertheless seem to represent similarly important locations. Indeed, in addition to the primary internments, some sites also bear evidence of the same practice of intentionally positioning new burials amongst older burials as found, for example, at the Zvejnieki cemetery (see Chapter 4.2.1, above). In this sense, the cemeteries might be considered ancestral places in which new burials became linked to the earlier inhabitants of the site particularly when dug through old graves (e.g., Larsson 2017, p. 343).

However, in addition to positioning new burials amongst older ones, the link could have also been established through other means. For example, some objects placed in the grave might have been in circulation for a long time or soil from an abandoned settlement site was chosen as the fill for the grave (Larsson 2017; see Chapter 2.3.2, above). In the Finnish territory, a similar practice was observed at the Hartikka cemetery, in which the fill of several graves consisted of coarse sand, small fragments of pottery and quartz flakes (Miettinen 1992b, p. 30). Since the soil surrounding the graves was undisturbed, the fill was likely taken from the nearby settlement site (Miettinen 1992b, p. 30). However, differing from the Zvejnieki graves (Larsson 2017, p. 340), the Hartikka settlement site typologically dates to the same period as the

cemetery (Middle Neolithic TCW; Miettinen 1992a–b). Yet, this also suggests that this practice related to establishing and maintaining a connection between the living and the dead.⁷ It thus seems reasonable to assume that at least during the Middle Neolithic an intentional connection with past generations was an important element in the hunter-gatherer funerary practice (Larsson 2017; Papers I and IV). This connection was maintained by using the same cemeteries, digging new graves amongst old internments or positioning new burials amongst older graves. Simultaneously, the grave fill might have been brought from an old, abandoned settlement site or from the dwelling of the living.

The continuous use of hunter-gatherer cemeteries ceased over time, although the sites were occasionally reused by the CWC people after a hiatus of several hundred years (Ahola 2016, pp. 188–189). This phenomenon suggests that although the sites were no longer used as cemeteries, they were nevertheless still well remembered (Paper IV). However, rather than considering them communal spaces, the sites might have been reinvented as places of the mythical past among the CWC populations (e.g., Wessman 2010, pp. 94–95; Olivier 2011, p. 70). Consequently, perhaps by burying their dead at these mythical places, the immigrating CWC people took possession of the new land (cf. Williams 1997). Since the CWC graves do not cut into the earlier graves, it seems that local ancestors were still treated respectfully (see Chapter 4.2.4, above). We must note, however, that the number of CWC graves discovered at prior cemeteries is limited. For example, from the Zvejnieki cemetery, only 11 CWC burials have been unearthed (Zagorskis 2004 [1989], p. 76). This indicates that the cemetery was only rarely reused and CWC community members were primarily buried elsewhere. Thus, it appears that the tradition of reuse was limited and selective, and not all prior burial sites were reused (Paper IV).

Since both hunter-gatherers and the CWC people occasionally buried their dead at an ‘ancestral’ or ‘mythical’ site, the continuous link through time seems to have been cherished by these populations (Paper I and IV). Indeed, although the reuse of old burial sites or the positioning of a new burial amongst older graves was not a common practice, the material remains of past people were also constantly present in the everyday life of these more recent populations. For example, the material remains of past generations were commonly discovered in the soils of old settlement sites (Larsson 2009a, p. 68; Larsson 2017, p. 339). Furthermore, in Swedish, Finnish and Estonian CWC vessels, crushed pottery from older vessels was often added to the clay matrix (Holmqvist et al. 2018). Although crock temper was used to prevent the cracking of vessels and, thus, carried a practical function, adding parts of old vessels to the new created a link to the use history of the old vessels as well as to the prior potters (Larsson 2009a, p. 354). Consequently, evidence from both

⁷ We must note that although no radiocarbon determinations are available from the Hartikka graves, it is, thus, impossible to determine whether the settlement site and the cemetery are, in fact, coeval.

the funerary realm as well as from everyday activities suggests that past generations played an important role in the cosmology of both hunter-gatherer and CWC populations.

4.3.2 THE IMPORTANCE OF LANDSCAPE: FURTHER CONNECTIONS TO ROCK ART

Alongside the memories of past practices, the natural topography seems to have played a significant role in the location of hunter-gatherer cemetery sites (Paper IV). This could result from the common approach to setting aside specific sites for rituals based on a topographical anomaly (Anttonen 1992; 1994; Bradley 2000). Indeed, according to Anttonen (1992, p. 37), topographical anomalies, such as stone and boulder fields, rocks, springs and cracks in the ground, have served as fixation points for boundaries separating the sacred from the profane and were, thus, selected for places such as for burials. This location on a topographical anomaly could have caused hunter-gatherer cemeteries to be as visible as burial sites associated with monumental burial architecture (cf. Bradley 2000). At the same time, the memory of practices conducted at such sites could have become entwined with the landscape and, thus, contributed even further to the recognition, remembrance and ritual reuse of an ancient cemetery (Paper IV).

In this thesis, the role of the natural topography was investigated from the perspective of the Jönsas cemetery (Paper IV). In line with the above-described phenomenon, the Jönsas cemetery was established next to smoothed bedrock situated at the highest point in the area (Paper IV; Fig 15b). Because most hunter-gatherer earth graves were either oriented towards the bedrock or situated in close proximity to it (Fig. 15b), it appears that the bedrock might have held a special symbolic meaning for the population that buried their dead at the site (Paper IV). Indeed, at a site where isostatic land-uplift shaped the surrounding landscape at a rapid pace (Leskinen and Pesonen 2008, Appendix 3; Paper IV), this bedrock was the only enduring element within that landscape.

In addition to the Jönsas cemetery, this phenomenon seemed to characterise other Mesolithic and Neolithic hunter-gatherer cemetery sites both within and beyond the Finnish territory. For example, since many Mesolithic hunter-gatherer cemeteries of northern Europe are often located either on islands (O'Shea and Zvelebil 1984; Larsson 1989; Zagorskis 2004[1987]) or within close proximity to rivers and lagoons (Larsson 1989; Borić 1999; Brinch Petersen 2015), a strong association between death and water has been hypothesised (Zvelebil 2003). Indeed, water has played a fundamental role in many prehistoric and historic ritual practices and conceptions of the cosmos (Oestigaard 2011), in which it often functioned as, for instance, a boundary between the sacred and the profane (e.g., Pentikäinen 1990; Lahelma 2008; Westerdahl 2015). However, in addition to water, other — often somehow anomalous

— topographical features likely contributed to the location of a cemetery (Conneller 2013). Indeed, at the TCW cemetery of Hartikka, all burials were oriented towards a round, peculiar looking natural hill situated at the highest point of the surrounding landscape (Miettinen 1992b, p. 32), whilst the Mesolithic burials at Lepenski Vir (Serbia) were placed in trapezoidal houses mimicking an impressive trapezoidal-shaped mountain opposite the site (Borić 1999). It, thus, seems likely that water might not have been the only topographical feature contributing to the location of a cemetery. But, rather, all unusual topographical features might have represented similar liminal boundaries between the sacred and profane (Paper IV).

This interpretation connects the Stone Age hunter-gatherer cemeteries more closely to the rock art tradition, and, thus, to the animistic–shamanistic cosmology these sites encode. Indeed, given the examples above, cemeteries were quite similarly situated to rock art sites — that is, near impressive natural topographical features. Similar to the rock art sites, these natural features might have been considered as special in some way, perhaps either inhabited by spirits or as liminal boundaries in which a connection to the other side was created (Paper IV). Simultaneously, they might have worked as natural monuments for cemetery sites. Remarkably, however, the landscape features appeared solely connected to cemetery sites. Yet, this further supports the theory that a multiplicity of mortuary practices prevailed within the earth grave tradition.

4.3.3 GRAVE OBJECTS: PACKED WITH MEANING

In addition to the anomalous landscape features, grave objects also connected hunter-gatherer earth graves to the shamanistic–animistic cosmology. Indeed, since many artefacts deposited in those graves were likely treated in specific ways, such as through intentional breakage, placing them upside down or avoiding them altogether (see Chapter 4.1.5, above), it appears as though, first, only certain material or artefact types were considered suitable as grave objects and, second, some grave objects required special treatment before being removed from circulation (Paper V). This, however, implies that inanimate objects might have been considered as living and, consequently, special rules concerning their final deposition existed.

Amongst hunter-gatherer grave objects — in particular, flint and metatuffite items — appear fragmented (Paper V). If broken deliberately, those items could relate, for instance, to the ritual killing of certain objects (e.g., Gravel-Miguel et al 2017) or to social exchanges during which holding fragments of a specific object links individuals and places (e.g., Chapman and Gaydarska 2007, pp. 8–10; see also Chapman 2000; Fowler 2004). The latter interpretation is supported by the fact that the raw materials used to construct such items do not naturally occur within Finnish territory and are, thus, likely ma-

terials received via an extensive gift-giving system between the Neolithic communities of the European boreal zone social (e.g., Herva et al. 2014; Kriiska 2015). Fragmented metatuffite rings (Figs. 2 and 13), for example, might relate to a practice in which two or more individuals possessed fragments of the same ring to signify their established relationship.

In addition, the small number of pottery vessels represents another feature encoding an animistic cosmology in the hunter-gatherer grave finds (Paper V). Indeed, the anomalous nature of rarely deposited pottery vessels — that is, the use of vessel bases and partial vessels or positioning vessels upside down — seems to suggest that pottery when placed in a burial required special treatment before placement in the grave (Paper V). This phenomenon resonates well with the ideas presented above (see Chapter 2.3.1), according to which hunter-gatherer pottery vessels were exceptional items made of a special substance derived from an underground world (Herva et al. 2017). Remarkably, within the Finnish territory, a similar line of thought might also have persisted within the CWC cosmology. Indeed, whilst pottery commonly lies within CWC graves, many vessels have been discovered in sherds or represent partial vessels (Appendix 1). Although this might represent a taphonomic issue, a vessel was positioned upside down in the Forsberg grave (Appendix 1; Chapter 4.2.4), suggesting that at least occasionally pottery in CWC graves also required special treatment.

Although hunter-gatherer and CWC burials show some indications of connections between their material culture, differences exist in how identity was represented within these graves. Indeed, as noted above (see Chapter 4.2.4), the CWC grave assemblage consists precisely of objects missing from hunter-gatherer graves, suggesting that a different set of rules concerning artefact deposition existed amongst CWC populations. Furthermore, since the presence of items made of or relating to domestic animals appears important to CWC mortuary practices, domesticated animals and a herder identity seem to stand at the core of the CWC cosmology (Paper III). Burials do not, however, always reflect the realities of the lives of the individuals buried (e.g., Parker Pearson 1999). Indeed, in reality, the CWC populations of central Europe practiced a mixed economy (e.g., Furholt 2014; Sjögren et al. 2016), that within the Finnish territory might have also included hunting, gathering and fishing (Furholt 2014). In this sense, the herder identity might also have formed an ideal that was underlined in ritual practices, whilst not forming a significant part of their everyday lives. Furthermore, the ritual practices could also have been carried out simply as they had been before, even if the original meaning of the action was already forgotten (cf. Nilsson Stutz 2003).

5 CONCLUSIONS

Based on the preceding, I draw the following conclusions:

- Although Finnish Stone Age earth graves primarily lack human remains and other perishable materials, they can be further examined and important new insights into Stone Age funerary practices and cosmology can be gained. Consequently, neither hunter-gatherer earth graves nor CWC graves can be referred to as ‘simple pit graves’.
- Systematic archaeological research revealed a total of 70 Stone Age earth grave sites in which a possible burial feature was documented or excavated. The vast majority of these sites consist of hunter-gatherer earth grave sites ($n = 53$), whilst the CWC tradition is observed within 17 sites.
- Based on the sparse radiocarbon determinations as well as relative dating relying on artefact typology, the majority of the graves date to the Middle Neolithic period, specifically the TCW and CWC periods.
- Evidence of Mesolithic and Early Neolithic hunter-gatherer earth graves remains scarce. Similarly, the number of hunter-gatherer graves succeeding TCW and preceding or coexisting with CWC is also small. In this sense, the Finnish Stone Age earth grave material specifically encodes early fourth millennium BC and third millennium BC mortuary practices.
- Identifiable human remains from Stone Age earth grave contexts derive from nine sites. Most sites represent TCW earth graves, although one possible Mesolithic grave and one CWC grave are also represented. According to the osteological analysis, the human remains identified belong to at least 21 individuals consisting of both adults and subadults.
- Although lacking perishable materials, Finnish Stone Age hunter-gatherer graves contain large numbers of objects made of non-perishable materials, such as stone, amber and ceramics. Most of these objects derive from the early fourth millennium BC TCW period, whereas only around 10 per cent date from the preceding and succeeding periods.
- Common trends in the hunter-gatherer material culture of death consisted of the use of amber and flint (in TCW burials) and a lack of axes, adzes and pottery vessels. Objects discovered in CWC graves — that is, axes, adzes and pottery vessels — clearly contrast with the hunter-gatherer material culture of death.
- Many flint and metatuffite objects discovered from TCW graves are fragmented. Although relying only on naked eye observation, this phenomenon could suggest intentional fragmentation relating, for example, to ritual killing of objects or to an inter-communal gift-giving system.

- During the TCW period, more grave goods accompanied individuals buried in cemeteries and those individuals were more often associated with evidence of body handling (e.g., fragments of bark or unburnt clay tempered with ochre), indicating that these individuals were treated differently from those buried in settlement sites.
- Rare pottery items placed within hunter-gatherer earth graves consisted of vessel bases or miniature or partial vessels — that is, seemingly anomalous items. Amongst these, only the miniature vessels were found intact, placed either upside down or in an upright position, whereas larger vessels or vessel bases were found as articulated shards.
- Microarchaeological studies conducted on soil samples collected from the Perttulanmäki CWC grave revealed mineralised goat hairs, suggesting that a goatskin was placed on the bottom of the grave. Combined evidence from the Finnish territory and neighbouring areas suggests that objects made of or relating to domesticated animals were placed within CWC graves. This indicates that domesticated animals and a herder identity were important parts of the CWC cosmology.
- The Finnish CWC graves show evidence of a hunter-gatherer component in, for example, the tradition of burying the dead underground and in the occasional treatment of pottery in a similar manner to how pottery was treated in the hunter-gatherer graves (i.e., by turning the vessel upside down or using rim sherds from pottery vessels as grave objects). The idea of interaction networks and continuity in local practices is further supported by the fact that CWC graves have occasionally been discovered within the same cemeteries as hunter-gatherer graves.
- A multiplicity of mortuary practices co-existed amongst hunter-gatherer populations. This phenomenon can be observed in the small number of burial sites and in the occasional discovery of loose human bones from Stone Age settlement sites. Since individuals were interred in both settlement sites and cemeteries, individuals were also buried in various ways within the earth grave tradition as well.
- Since only a handful of documented CWC inhumations exist within the Finnish territory, a multiplicity of mortuary practices might also have existed amongst the Finnish CWC population.
- Establishing an intentional connection with past generations was an important element of both Middle Neolithic hunter-gatherer and CWC funerary practices and cosmology. In the hunter-gatherer burial tradition, this phenomenon can be seen in the positioning of new burials amongst older graves and in the CWC tradition in the reuse of older cemeteries.
- Natural topographical features contributed to the location of hunter-gatherer cemeteries. Similar to rock art sites, the topographical features

connected with hunter-gatherer cemeteries stand out from the surrounding landscape. This phenomenon further connects the hunter-gatherer earth grave tradition to the rock art tradition.

Future research topics emerging from this study relate specifically to further analyses that could be conducted on the material. For example, the fragmented and partial artefacts collected from hunter-gatherer graves should be subjected to further lithic analysis in which the origins of the raw material and the intentionality of the fragmentation could be studied in more detail. Simultaneously, parallels to the practice of intentional breakage should be investigated beyond the Finnish territory. Indeed, since the Finnish materials strongly resemble Stone Age hunter-gatherer mortuary practices of the Baltic area, for instance, the tradition of intentional breakage or fragmentation could also be present at burial sites beyond Finnish borders.

The hunter-gatherer material culture of death related to the use of pottery and pottery vessels also warrants further study. Indeed, since similarities between Finnish hunter-gatherer mortuary practices and the funerary tradition of the Swedish Pitted Ware Culture already strongly resemble one another in their use of pottery, it may be that similar funerary practices also exist amongst other Neolithic hunter-gatherer populations in neighbouring areas of Finland. Furthermore, the scarce pottery vessels discovered from the Finnish hunter-gatherer earth graves should be subjected to, for instance, lipid analyses to investigate the use of these objects. To determine whether the pottery vessels unearthed from CWC graves indeed contained milk, these vessels should also be subjected to a similar analysis.

According to this thesis, the microarchaeological study of soil samples collected from earth grave contexts carries a huge potential. In future, this method should also be applied to the nearly 200 ochre samples deposited in the archaeological collections of the Finnish Heritage Agency. This approach could be particularly fruitful in examining burials in which the use of a body wrapping is suspected. Indeed, whilst the use of hides or skins has been commonly suspected (e.g., Larsson 1988; Kannegaard Nielsen and Brinch Petersen 1993; Zagorskis 2004 [1989]), thus far determination of the material used to wrap bodies has been impossible (Nilsson Stutz 2003, p. 304). Given the findings presented in this thesis, it might be possible that the Finnish materials — overlooked in these studies because of the lack of human remains — might contribute to such future studies by offering evidence of the materials used for the wrappings.

In addition, the presence of CWC graves at prior hunter-gatherer cemeteries or settlement sites is also a phenomenon worth further study. Indeed, even if the material culture of the CWC funerary ritual is well known, the full picture concerning CWC mortuary practices remains blurred, whereby little is known regarding the cosmology these practices encoded. However, given the findings presented here, a continuous link through time could represent something cherished by the CWC people. In future, a systematic archaeological study

should be conducted at the CWC burial sites, as well as beyond the Finnish territory, and new AMS dates should be obtained both from inhumations and the sites themselves.

According to this study, natural topographical features contributed to the location of Stone Age hunter-gatherer cemeteries. In this study, this phenomenon from a single hunter-gatherer cemetery. However, the positive findings obtained from this site suggest that the phenomenon should be studied more systemically, particularly in relation to rock art. For example, burial sites could be subjected to GIS analysis. That is, positioning the location of cemetery site in relation to rock art sites to determine whether areas of ritual activity existed might prove fruitful.

To conclude, whilst Finnish Stone Age earth graves largely lack human remains and other perishable materials, the graves are not as poorly preserved as one might think. Rather, this thesis shed light on the Stone Age earth grave tradition, mortuary practices and cosmology in mainland Finland. Simultaneously, several new possibilities for future analyses emerged. Since the human remains are largely lacking, grave structures call for a more creative approach in which the remains should be examined from several different angles. Indeed, the lack of perishable materials challenges researchers to identify innovative methods or new theoretical perspectives, and thus can also be viewed as a strength of the Finnish materials.

REFERENCES

Archival sources

- Äyräpää (Europaeus), A. (1922). *Kaivaukseni Jäkärälän kivikautisella asuinpaikalla Maarian pitäjässä vuonna 1922*. [Research report] National Heritage Agency, Helsinki.
- Äyräpää (Europaeus), A. (1927). *Asuinpaikka- ja hautalöytö kivikaudelta Kii-koisten pitäjän Jaaran kylän Uudenjaaran talon maalta. Tutkimukset suorittanut maisteri A. Europaeus syyskuussa 1927*. [Research report] National Heritage Agency, Helsinki.
- Äyräpää, A. (1932). *Kuoppakangas. Vasarakirveshaudan tarkastus 1932*. [Research report] National Heritage Agency, Helsinki.
- Äyräpää, A. & Hukkinen, E. (1949). *Vasarakirveshauta Kylmäkosken pitäjän Hautaan kylässä Maunulankulmalla. Tutk. Aarne Äytävä & Eino Hukkinen v. 1949*. [Research report] National Heritage Agency, Helsinki.
- Edgren, T. (1998). *Kolmhaara "revisited"*. [A manuscript of an oral presentation given at the Annual meeting of the Finnish Antiquarian Society May 7th 1998] Torsten Edgren's personal archives, Helsinki.
- Edgren, T. (1999). *Myrskylä Kiparkatti. Vasarakirveen löytöpaikan kaivaus 1969*. [Research report] National Heritage Agency, Helsinki.
- Hackman, A. (1913). *Ilmajoki Jouppila Piirtola. Kivikautisen asuinpaikan kaivaus 1913*. [Research report] National Heritage Agency, Helsinki.
- Hakonen, A. (2019). *Simo Tainiari. Kivikautisen kalmiston ja asuinpaikan kartoitus, prospektointi ja koekaivaus 15.-16.5., 11.-14.6. ja 13.-18.8.2018*. [Research report] University of Oulu.
- Hiekkanen, M. (1991). *Kivikautisia asuinpaikkalöytöjä, jotka otettiin talteen Markus Hiekkasen Lappfjärds Folkhögskolanissa 1980-1981 pitämän arkeologian kurssin koekaivauksella Björnåsenin kivikautisella asuinpaikalla*. [Find catalogue] National Heritage Agency, Helsinki.
- Hukkinen, E. (1951). *Sääksmäki Itko Vasarakirveshaudan kaivaus 1950*. [Research report] National Heritage Agency, Helsinki.
- Huurre, M. (1955). *Kertomus muinaistieteellisistä kaivauksista Utajärven Niskankylällä kesällä 1955*. [Research report] National Heritage Agency, Helsinki.
- Kopisto, A. (1954). *Kertomus tutkimuksista Lapuan Pitkämäen kivikautisella asuinpaikalla v. 1954*. [Research report] National Heritage Agency, Helsinki.
- Kankkunen, P. (1994). *Espoo Bosmalm. Kivikautisen asuinpaikan kaivaus. Päivi Kankkunen 1987*. [Research report] National Heritage Agency, Helsinki.
- Kankkunen, P. (2003). *Lieto Knaapin hiekkakuoppa. Mesolittisen kalmiston koekaivaus 2003*. [Research report] National Heritage Agency, Helsinki.
- Kankkunen, P. & Katiskoski, K. (2004). *Pieksänmäen mlk Marketanhiekka kivikautisen asuinpaikka-alueen koekaivaus 2000-2001*. [Research report] National Heritage Agency, Helsinki.
- Katiskoski, K. (1992). *Liekka 24 Pokronlampi. Kivikautisen/varhaismetallikautisen asuinpaikan koekaivaus 1991*. [Research report] National Heritage Agency, Helsinki.

- Katiskoski, K. (1999). *Taipalsaari Vaateranta. Kivikautisen kalmiston ja asuinpaikan kaivaus 1998*. [Research report] National Heritage Agency, Helsinki.
- Karjalainen, T. (1992). *Sulkava Vilkajärvi. Kivikautisen asuinpaikan kaivaus 1991*. [Research report] National Heritage Agency, Helsinki.
- Lahti, E.-K. (2004). Osteologinen analyysi: Joroinen Kanava 33923 Eeva-Liisa Schulz. [Research report] National Heritage Agency, Helsinki.
- Leppäaho, J. (1936). *Viikan yksinäistila. Kivikautisen hautalöytöpaikan tarkastus 1936*. [Research report] National Heritage Agency, Helsinki.
- Luhio, V. (1963). *Kuortane Mäyry Haavistonharju. Kivikautisen asuinpaikan kaivaus*. [Research report] National Heritage Agency, Helsinki.
- Luhio, V. 1966. *Leppävirta Moninmäki Holopainen. Fil.tri. Ville Lühön virkamatkallaan kaivauttamat kivikautiset asuinpaikkalöydöt*. [Find catalogue] National Heritage Agency, Helsinki.
- Laulumaa, V. (1997). *Kristiinankaupunki Dagsmark Rävåsen. Kivikautisen asuinpaikan kaivaus v. 1997*. [Research report] National Heritage Agency, Helsinki.
- Leskinen, S. (1998). *Vantaa Maarinkunnas. Kivikautisen asuinpaikan kaivaus. Sirpa Leskinen 1997*. [Research report] National Heritage Agency, Helsinki.
- Meinander, C.F. (1938). *Löydöt kivikautisesta haudasta Mynämäen valastenkylän Tuomalan talon maalla*. [Find catalogue] National Heritage Agency, Helsinki.
- Miettinen, M. (1998). *Pihtipudas 54 Pohjoisniemi-Tilkku. Kivikautisen asuinpaikan koekaivaus. Mirja Miettinen 1996*. [Research report] National Heritage Agency, Helsinki.
- Miettinen, M. (2006). *Evijärvi Timonen 1. Kivikautisen asuinpaikan kaivaus 1971 ja 1971. Mirja Miettinen*. [Research report] National Heritage Agency, Helsinki.
- Miettinen, M. (2007). *Evijärvi Kotikangas. Kivikautisen asuinpaikan koekaivaus 1973*. [Research report] National Heritage Agency, Helsinki.
- Pesonen, P. (1997). *Rääkkylä 7 Pörrinmökki. Kivikautisen asuinpaikan kaivaus. Petro Pesonen 1996*. [Research report] National Heritage Agency, Helsinki.
- Pesonen, P. (1998). *Rääkkylä [45] Vihi 1. kivikautisen asuinpaikan kaivaus 1997*. [Research report] National Heritage Agency, Helsinki.
- Pesonen, P. (2012). *Oulu Hangaskangas E. Kivi- ja pronssikautisen asuinpaikan arkeologinen kaivaus 14.6.-20.7.2012*. [Research report] National Heritage Agency, Helsinki.
- Pohjakallio, L. (1978). *Kaivaukset Vieremän Hukkalanharjulla kesällä 1978*. [Research report] National Heritage Agency, Helsinki.
- Roine, L. (1966). *Kertomus Pihtiputaan muiniasjännösten inventoinnista kesällä 1964*. [Research report] National Heritage Agency, Helsinki.
- Räty, J. (1972). *Vantaan Kaivoksen Gröndal 2:n kivikautisen asuinpaikan kaivaukset vuodelta 1972*. [Research report] National Heritage Agency, Helsinki.
- Salmo, H. (1958). *Tarkastusmatka Lahden kaupungin Okeroisten Koivulan tilan maalle, Kasakkamäen rinteeseen 21.X. 1958*. [Research report] National Heritage Agency, Helsinki.
- Seger, T. (1986). *Vantaa Myyrmäki Jönsas. Kertomus kivi- ja varhaismetallikautisen asuin- ja kalmistoalueen kaivauksesta (S. Ojonen 1977)*. [Research report] National Heritage Agency, Helsinki.

- Taskinen, H. (1983). *Harjavalta Hiittenharju. Punamultahaudan kaivauskertomus 1983*. [Research report] National Heritage Agency, Helsinki.
- Taskinen, H. (1986). *Suomusalmi TB:n ranta. Esihistoriallisen asuinpaikan koekaivaus 1986*. [Research report] National Heritage Agency, Helsinki.
- Torvinen, M. (1980a). *Sievi, Markkula, Sopenkangas. Kivikautisen asuinpaikan kaivaus 8.-14.7.1979*. [Research report] National Heritage Agency, Helsinki.
- Torvinen, M. (1980b). *Lieto, Rähälä-Asemanseutu vesijohtolinjan rakentamisen takia suoritettu koekaivaus Vintalan ja Kukkarkosken kylissä 26.5–31.7.1980*. [Research report] National Heritage Agency, Helsinki.
- Torvinen, M. (1984). *Teuva Komsinkangas (Teuva 43). Kivikautisen haudan rippeiden pelastuskaivaus 26.-27.9.1983*. [Research report] National Heritage Agency, Helsinki.
- Wallenius, T. (1990). *Simo 40 Tainiara. Kivikautisen asuinpaikan kaivaus 1989*. [Research report] National Heritage Agency, Helsinki.
- Wallenius, T. (1991). *Simo 40 Tainiara. Kivikautisen asuinpaikan kaivaus 1990*. [Research report] National Heritage Agency, Helsinki.
- Wallenius, T. (1992). *Simo 40 Tainiara. Kivikautisen asuinpaikan kaivaus 1991*. [Research report] National Heritage Agency, Helsinki.
- Väkeväinen, L. (1979). *Kuusamo 12 Tuovila Jokela. Kivikautisen asuinpaikan kaivaus*. [Research report] National Heritage Agency, Helsinki.
- Wickholm, A. (2001). *Karis Kroggård Säterigatan. Ut-grävningsrapport över en stenåldersboplats och en röd-ockragrav 2000*. [Research report] National Heritage Agency, Helsinki.
- Voionmaa, J. (1935). *Aimala, Littunen. Venekirveshautapaikan tarkistus 1935*. [Research report] National Heritage Agency, Helsinki.

Unpublished sources

- Bourgeois, Q. (2013). *Monuments on the Horizon: The Formation of the Barrow Landscape*. PhD. Leiden University. Available at: <https://openaccess.leidenuniv.nl/handle/1887/20381> [Accessed 5 May 2017].
- Gjerde, J.M. (2010). *Rock art and landscapes. Studies of Stone Age rock art from Northern Fennoscandia*. PhD. University of Tromsø.
- Gray Jones, A. (2011). *Dealing with the dead: Manipulation of the body in the mortuary practices of Mesolithic north west Europe*. PhD. University of Manchester. Available at: <https://www.escholar.manchester.ac.uk/api/datastream?publicationPid=uk-ac-manscw:128658&datastreamId=FULL-TEXT.PDF> [Accessed 21 October 2016].
- Hecht, D. (2007). *Das Siedlungswesen der Schnurkeramik im südlichen Mitteleuropa. Eine Studie zu einer vernachlässigten Fundgattung im Übergang vom Neolithikum zur Bronzezeit*. PhD. University of Heidelberg. Available at: <http://www.ub-heidelberg.de/archiv/7313.heidelberg>. [Accessed 19 May 2016].
- Peyroteo Stjerna, R. (2016). *On Death in the Mesolithic: Or the Mortuary Practices of the Last Hunter-Gatherers of the South-Western Iberian Peninsula, 7th–6th Millennium BCE*. PhD. Uppsala University.
- Salomon, H. (2009). *Les matières colorantes au début du paléolithique supérieur: Sources, transformations et fonctions*. PhD. University of Bordeaux 1.
- Saxe, A. (1970). *Social Dimensions of Mortuary Practices*. PhD. University of Michigan.

Literature

- Ahola, M. (2016). Re-thinking the Stone Age Burial Ground of Jönsas, southern Finland. In: J. Grünberg, B. Gramsch, L. Larsson, J. Orschiedt and H. Meller, H., eds, *Mesolithic burials - Rites, symbols and social organisation of early postglacial communities 18–21. International Conference Halle (Saale), Germany, 18th-21st September 2013*. Tagungen des Landesmuseums für Vorgeschichte Halle 13/I 2016. Halle (Saale): Landesamt für Denkmalflege und Archäologie Sachsen-Anhalt, pp. 185–192.
- Allentoft M.E., Sikora M., Sjögren K-G., Rasmussen, S., Rasmussen, M., Stenderup, J., et al. (2017). Population genomics of Bronze Age Eurasia. *Nature* 522, pp.167–172. <https://doi.org/10.1038/nature14507> PMID: 26062507
- Andersson, H. (2004). Vart tog benen vägen? Återbesök i gropkerasmska gravar på Gotland. In: K. Von Hackwitz and T. Werner, eds, *Aktuell Arkeologi VIII*. Stockholm Archaeological Reports, Nr 42, pp. 5–20.
- Anthony, D. W. (2007). *The Horse, the Wheel and Language. How Bronze-Age Riders from the Eurasian Steppes Shaped the Modern World*. Princeton and Oxford: Princeton University Press.
- Anttonen, V. (1992). The concept of pyhä (sacred) in pre-Christian Finnish religion. In: M. Hoppál and J. Pentikäinen, eds, *Northern Religions and Shamanism*. Helsinki: Finnish Literacy Society, pp. 31–38.
- Anttonen, V. (1996). *Ihmisen ja maan rajat: 'pyhä' kulttuurisena kategoriana*. Helsinki: Suomalaisen Kirjallisuuden Seura.
- Anttonen, V. (2003). Sacred Sites as Markers of Difference. Exploring Cognitive Foundations of Territoriality. In: L. Tarkka, ed., *Dynamics of Tradition. Perspectives on Oral Poetry and Folk Belief. Essays in Honour of Anna-Leena Siikala on her 60th Birthday 1st January 2003*. Studia Fennica Folkloristica 13. Helsinki: Finnish Literature Society, pp. 291–305.
- Arvidsson, S. (2006). *Aryan Idols. Indo-European Mythology as Ideology and Science*. Chicago: Chicago University Press
- Äyräpää (Europaeus), A. (1915). Förvarv till Statens Historiska Museum år 1913. Den förhistoriska avdelningen. *Finskt Museum* 1915, pp. 1–19.
- Äyräpää, A. (1931). Kauhavan Perttulanmäen kivistautinen hauta. *Suomen museo* 38, pp. 1–15.
- Äyräpää, A. (1939). Suomen kiviakauden kulttuurimuodot. *Suomalaisen tiedakateman esitelmät ja pöytäkirjat* 1937, pp. 101–126.
- Bell, C. (1992). *Ritual Theory, Ritual Practice*. Oxford: Oxford University Press.
- Berggren, Å. and Brink, K. (2010). För levande och döda – begravningsritual och social identitet i yngre stenålder. In: B. Nilsson and E. Rudbeck, eds., *Arkeologiska och förhistoriska världar: fält, erfarenheter och stenåldersplatser i sydvästra Skåne*. Malmö: Malmö museer, pp. 253–308.
- Binford, L. (1971). Mortuary Practices: their Study and their Potential. In: J. Brown, ed., *Approaches to the Social Dimensions of Mortuary Practices*. Washington D.C.: Society for American Archaeology, pp. 6–29.
- Bläuer, A. & Kantanen, J. (2013). Transition from hunting to animal husbandry in Southern, Western and Eastern Finland: new dated osteological evidence. *Journal of Archaeological Science*, 40, pp. 1646–1666.
- Borić, D. (1999). Places that Created Time in the Danube Gorges and Beyond, c. 9000–5500 BC. *Documenta Praehistorica*, 26, pp. 41–70.
- Borić, D. (ed.) (2010). *Archaeology and Memory*. Havertown: Oxbow Books

- Bourdieu, P. (1977). *Outline of a Theory of Practice*. Cambridge: Cambridge University Press.
- Bourgeois, Q. & Kroon, E. (2017). The impact of male burials on the construction of Corded Ware identity: Reconstructing networks of information in the 3rd millennium BC. *PLoS ONE*, 12(10) <https://doi.org/10.1371/journal.pone.0185971>
- Bradley, R. (2000). *An Archaeology of Natural Places*. London: Routledge.
- Bradley, R. (2002). *The Past in Prehistoric Societies*. London: Routledge
- Brinch Petersen, E. (2015). *Diversity of Mesolithic Vedbæk*. *Acta Archaeologica* 86 (1).
- Brinch Peteresen, E. (2016). Afterlife in the Danish Mesolithic – the creation, use and discarding of “Loose Human Bones”. In: J. Grünberg, B. Gramsch, L. Larsson, J. Orschiedt and H. Meller, H., eds, *Mesolithic burials - Rites, symbols and social organisation of early postglacial communities 18–21. International Conference Halle (Saale), Germany, 18th-21st September 2013*. Tagungen des Landesmuseums für Vorgeschichte Halle 13/1 2016. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, pp. 47–62
- Brinch Petersen, E. & Meiklejohn, C. (2003). Three Cremations and a Funeral: Aspects of Burial Practice in Mesolithic Vedbæk. In: L. Larsson, K. Knutsson, O. Loefer and A. Åkerlund, eds., *Mesolithic on the Move. Papers presented at the Sixth International Conference on the Mesolithic in Europe, Stockholm 2000*. Oxford: Oxbow books, pp. 485–493.
- Burenhult, G. (1997). Gravarnas vittnesbörd. In: G. Burenhult, ed., *Ajvide och den moderna arkeologin*. Stockholm: Natur och kultur, pp. 52–70.
- Butrimas, A. (2012). *Donkalnio ir Spigino Mezolito-Neolito kapinynai. Seniausio laidojimo paminklai lietuvoje*. Vilnius: Vilniaus dailes akademijos leidykla.
- Carpelan, C. (1999). Käännekohtia Suomen esihistoriassa aikavälillä 5100–1000 eKr. In: P. Fågelberg, ed., *Pohjan poluilla: Suomalaisten juuret nykytutkimuksen mukaan*. Bidrag till kännedom av Finlands natur och folk 153. Helsinki: Finska vetenskaps-societeten, pp. 249–280.
- Chapman, J. (2000). *Fragmentation in Archaeology: People, Places and Broken Objects in the Prehistory of South-Eastern Europe*. London: Routledge.
- Chapman, J. and Gaydarska, B. (2007). *Parts and Wholes: Fragmentation in Prehistoric Context*. Oxford: Oxbow Books.
- Conneller, C. (2013). Power and Society. Mesolithic Europe. In: S. Tarlow and L. Nilsson Stutz, eds., *The Oxford Handbook of Archaeology of Death and Burial*. Oxford: Oxford University Press, pp. 347–358.
- Connerton, P. (1989). *How Societies Remember*. Cambridge: Cambridge University Press.
- Cramp, L.J.E., Evershed, R.P., Lavento, M., Halinen, P., Mannermaa, K., Oinonen, M., Kettunen, J., Perola, M., Onkamo, P. and Heyd, V. (2014). Neolithic dairy farming at the extreme of agriculture in northern Europe. *Proceedings of the Royal Society B, Biological Sciences*, 281 (1791), pp. 1–9.
- Duday, H. (2009). *The Archaeology of the Dead: Lectures in Archaeothanatology*. Translated by A.M. Cipriani and J. Pearce. Oxford & Philadelphia: Oxbow Books.
- Ebbesen, K. (2006). *The Battle Axe Period. Stridsøksetid*. Copenhagen: At-tika.

- Edgren, T. (1958). Ekenäs-graven. Ett bidrag till kännedomen om båt- och kulturen i östra Nyland. *Finskt Museum*, LXV, pp. 27–49.
- Edgren, T. (1959). Kolmhaara-gravarna. *Finskt Museum*, LXVI, pp. 5–25.
- Edgren, T. (1966). *Jäkärlä-gruppen. En västfinsk kulturgrupp under yngre stenåldern*. Suomen muinaismuistoyhdistyksen aikakaussikirja 64. Helsinki: Weilin+Göös.
- Edgren, T. (1970). *Studier över den snökeramiska kulturens keramik i Finland*. Suomen Muinaismuistoyhdistyksen Aikakaussikirja 72. Helsinki: Suomen muinaismuistoyhdistys.
- Edgren, T. (1982). *Formgivning och function. En kamkeramisk studie*. Iskos 3. Helsinki: Finska fornminnesföreningen.
- Edgren, T. (1984). Kivikausi. In: Y. Blomstedt, ed. *Suomen historia I*. Espoo: Weilin+Göös, pp. 19–97.
- Edgren, T. (1999). Alkavan rautakauden kulttuurikuva Länsi-Suomessa. In: P. Fogelberg, ed., *Pohjan poluilla. Suomalaisten juuret nykytutkimuksen mukaan*. Helsinki: Finska vetenskaps-societeten, pp. 311–333.
- Edgren, T. (2006). Kolmhaara reconsidered. Some new observations concerning Neolithic burial practice in Finland. In Larsson, L. & Zagorska, I. (eds.), *Back to the Origin. New research in the Mesolithic-Neolithic Zvejnieki cemetery and environment, Northern Latvia*: 327–336. Stockholm: Almqvist & Wiksell International.
- Edgren, T. (2007). On the non-megalithic mortuary practices in Finland. In: L. Larsson, F. Lüth and T. Terberger, eds., *Innovation and continuity – Non-Megalithic Mortuary Practices in the Baltic. New Methods and Research into the Development of Stone Age Society. International Workshop at Schwerin on 24–26 March 2006*. Bericht der Römisch-Germanischen Kommission 88 (2007). Mainz am Rhein: Zabern, pp. 501–520.
- Engblom, L. (1992). Tervolan punamultahaudat. In: M. Huurre, P. Halinen, M. Lavento and J. Moisanen, eds., *Kentältä poimittua: kirjoitelmia arkeologian alalta*. Museovirasto, esihistorian toimisto, julkaisu n:o 2. Helsinki: Museovirasto, pp. 50–7.
- Ekengren, F. (2013). Contextualizing Grave Goods. Theoretical Perspectives and Methodological implications. In: S. Tarlow and L. Nilsson Stutz, eds., *The Oxford Handbook of Archaeology of Death and Burial*. Oxford: Oxford University Press, pp. 173–191.
- Fahlander F. (2004). Archaeology and Anthropology – brothers in arms. On analogies in 21st –century archaeology. In: F. Fahlander and T. Oestigaard, eds, *Material Culture and Other Things. Post-disciplinary Studies in the 21st Century*. GotArc Series c, vol. 61. Gothenburg: University of Gothenburg, pp. 185–212.
- Fahlander, F. (2012). Mesolithic Childhoods: Changing Life-Courses of Young Hunter-Fishers in the Stone Age of Southern Scandinavia. *Childhood in the Past* 5 (2012), pp. 20–34.
- Fischer, U. (1956). *Die Gräber der Steinzeit im Saalegebiet: Studien über neolithische und frühbronzezeitliche Grab- und Bestattungsformen in Sachsen-Thüringen*. Berlin: De Gruyter.
- Fowler, C. (2004). *The Archaeology of Personhood. An anthropological approach*. London and New York: Routledge.
- Furholt, M. (2014). Upending a ‘Totality’: Re-evaluating Corded Ware Variability in Late Neolithic Europe. *Proceedings of the Prehistoric Society*, 80, pp. 67–86.

- Giddens, A. (1979). *Central Problems in Social Theory: Action, Structure and Contradiction in Social Analysis*. Berkley and Los Angeles: University of California Press.
- Goldhahn, J. and Fuglestedt, I. (2012). Engendering North European Rock Art: Bodies and Cosmologies in Stone and Bronze Age Imagery. In: J. McDonald and P. Veth, eds, *A Companion to Rock Art*. Oxford: Blackwell Publishing Ltd, pp. 237–260.
- Gravel-Miguel, C., Rien-Salvatore, J., Maggi, R., Martino, G. and Barton, C.M. (2017). The Breaking of Ochred Pebble Tools as Part of Funerary Ritual in the Arene Candide Epigravettian Cemetery. *Cambridge Archaeological Journal*, 27(2), pp. 331–350
- Grünberg, J.M. (2000). *Mesolithische Bestattungen in Europa: Ein Beitrag zur vergleichenden Gräberkunde*. Internationale Archäologie 40. Rahden/Westfalen: Verlag Marie Leidorf GmbH.
- Gummeson, S. and Molin, F. (2016). The Mesolithic cemetery at Strandvägen, Motala, in eastern central Sweden. In: J. Grünberg, B. Gramsch, L. Larsson, J. Orschiedt and H. Meller, H., eds, *Mesolithic burials - Rites, symbols and social organisation of early postglacial communities 18–21. International Conference Halle (Saale), Germany, 18th-21st September 2013*. Tagungen des Landesmuseums für Vorgeschichte Halle 13/1 2016. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, pp. 145–160.
- Günther, T., Malmström, H., Svensson, E.M., Omrak, A., Sánchez-Quinto, F., et al. (2018). *Population genomics of Mesolithic Scandinavia: Investigating early postglacial migration routes and high-latitude adaptation*. PLOS Biology, 16(1): e2003703. <https://doi.org/10.1371/journal.pbio.2003703>
- Gurina, N.N. (1956). *Oleneostrovskiy mogilnik*. Materialy i issledovaniya po arkheologii SSSR 47.
- Haak, W., Lazaridis, I., Patterson, N., Rohland, N., Mallick, S., Llamas, B., et al. (2015). Massive migration from the steppe was a source for Indo-European languages in Europe. *Nature*, 522, pp. 207–211. <https://doi.org/10.1038/nature14317> PMID: 25731166.
- Haggrén, G., Halinen, P., Lavento, M., Raninen, S. and Wessman, A. (eds.) (2015). *Muinaisuutemme jäljet: Suomen esi- ja varhaishistoria kivikaudelta keskiajalle*. Helsinki: Gaudeamus.
- Halinen, P. (1997). Kaustisen Kankaan asuinpaikka ja punamultahaudat. *Muinaistutkija* 2/1997, pp. 18–27.
- Halinen, P. (1999). Burial Practises and the Structure of Societies during the Stone Age in Finland. In: M. Huurre, ed., *Dig it all. Papers dedicated to Ari Siiriäinen*. Helsinki: The Finnish Antiquarian Society and The Archaeological Society of Finland, pp. 173–179.
- Halinen, P. (2015). Kivikausi. In G. Haggrén, et al. eds. *Muinaisuutemme jäljet: Suomen esi- ja varhaishistoria kivikaudelta keskiajalle*. Helsinki: Gaudeamus, pp. 19–124.
- Härke, H. (1994). Data Types in Burial Analysis. In: B. Stjernqvist, ed., *Prehistoric Graves as a Source of Information: Symposium at Kastlösa, Öland, May 21-23, 1992*. Stockholm: Kungliga Vitterhets Historie och Antikvitets Akademien, pp. 31–39.
- Helskog, K. (1999). The Shore Connection. Cognitive Landscape and Communication with Rock Carvings in Northernmost Europe. *Norwegian Archaeological Review*, 32(2), pp. 73–94.

- Herva, V-P. and Ylimaunu, T. (2009). Folk Beliefs, Special Deposits, and Engagement with the Environment in Early Modern Northern Finland. *Journal of Anthropological Archaeology* 28(2), pp. 234–243
- Herva, V-P., Nordqvist, K., Lahelma, A. and Ikäheimo, J. (2014). Cultivation of Perception and the Emergence of the Neolithic World. *Norwegian Archaeological Review* 47(2), pp. 141–160.
- Herva, V-P., Mökkönen, T. and Nordqvist, K. (2017). A northern Neolithic? Clay work, cultivation and cultural transformations in the boreal zone of north-eastern Europe, c.5300–3000 BC. *Oxford Journal of Archaeology* 36(1), pp. 25–41.
- Hertz, R. (1960 [1907]). A Contribution to the Study of the Collective Representation of Death. In: R. Hertz, ed., *Death and the Right Hand*. Translated by Rodney and Claudia Needham. London: Cohen & West cop., pp. 27–86.
- Heyd, V. (2017). Kossinna's smile. *Antiquity*, 91, pp. 348–359.
- Hodder, I. (1986). *Reading the Past: Current Approaches to Interpretation in Archaeology*. Cambridge: Cambridge University Press.
- Holloway, I. (1997). *Basic Concepts for Qualitative Research*. London: Blackwell Science.
- Holmqvist, E., Larsson, Å.M., Kriiska, A., Palonen, V., Pesonen, P., Mizohata, K., Kouki, P. & Räisänen, J. (2018). Tracing grog and pots to reveal neolithic Corded Ware Culture contacts in the Baltic Sea region (SEM-EDS, PIXE). *Journal of Archaeological Science*, 91, pp. 77–91.
- Huurre, M. (1986). Esihistoria. In: M. Huurre, ed., *Kainuun historia I*. Kajaani: Kajaanin maakuntaliitto, pp. 5–184.
- Huurre, M. (1998): *Kivikauden Suomi*. Helsinki: Otava.
- Ingold, T. (2001). *The Perception of the Environment: essays on Livelihood, Dwelling and Skill*. London: Routledge.
- Insoll, T. (2004). *Archaeology, ritual, religion*. London: Routledge.
- Insoll, T. (2011a). Ritual and Religion in Archaeological Perspective. In: T. Insoll, ed., *The Oxford Handbook of the Archaeology of Ritual and Religion*. Oxford: Oxford University Press, pp. 1–4.
- Insoll, T. (2011b). Animism and Totemism. In: T. Insoll, ed., *The Oxford Handbook of the Archaeology of Ritual and Religion*. Oxford: Oxford University Press, pp. 1004–1016.
- Jaanits, L. (1957). Neue Gräberfunde auf dem spätneo-lithischen Wohnplatz Tamula in Estland. In: Meinander, C.F., ed., *Studia neolithica in honorem Aarne Äyräpää*. Suomen Muinaismuistoyhdistyksen Aikakausikirja 58. Helsinki: Suomen muinaismuistoyhdistys, pp. 80–100.
- Jeunesse, C. (2014). Pratiques funéraires campaniformes en Europe. Faut-il remettre en cause la dichotomie Nord-Sud? La question de la réutilisation des sépultures monumentales dans l'Europe du 3^e millénaire. In: P. Lefranc, A. Denaire and C. Jeunesse, eds., *Données récentes sur les pratiques funéraires néolithiques de la Plaine du Rhin supérieur*. BAR International Series, 2633 (2014), pp. 211–228.
- Johanson, K. (2006). The contribution of stray finds for studying everyday practices: the example of stone axes. *Estonian Journal of Archaeology* 10 (2), pp. 99–131
- Jones, E.R., Zarina, G., Moiseyev, V., Lightfoot, E., Nigst, P.R., Manica, A., Pinhasi, R. and Bradley, D.G. (2017). The Neolithic Transition in the Baltic Was Not Driven by Admixture with Early European Farmers. *Current Biology* 27(5), pp. 76–582. <http://doi: 10.1016/j.cub.2016.12.060>

- Jordan, P.D. (2003). *Material Culture and Sacred Landscape: The Anthropology of the Siberian Khanty*. Walnut Creek: AltaMira Press.
- Kannegaard Nielsen, E. & Brinch Petersen, E. (1993). Grave, mennesker og hunde. In: S. Hvass and B. Storgaard, eds., *Da klinger i muld...25 års arkeologi i Danmark*. Aarhus: Aarhus Universitets Forlag, pp. 76–81.
- Katiskoski, K. (2003). Cemetery and the dwelling site Vaateranta in Taipalsaari, southeastern Finland. *Suomen Museo*, 110, pp. 81–125.
- Kirkinen, T. (2015). The Role of Wild Animals in Death Rituals: Furs and Animal Skins in the Late Iron Age Inhumation Burials in Southeastern Fennoscandia. *Fennoscandia archaeologica*, XXXII, pp. 101–120.
- Kirkinen, T. (2019). Between skins: Animal skins in the Iron Age and historical burials in eastern Fennoscandia. Helsinki: University of Helsinki.
- Kivikoski, E. (1934). Paimion Rukkijoen vasarakirveshauta. *Suomen museo*, 41, pp. 34–40.
- Koivisto, S. (2010). Luihin ja ytimiin: Pyyntiä ja elämää Itämeren äärellä noin 7500 vuotta sitten. *Helsingin pitäjä*, 31, pp. 8–21.
- Kostyleva, E.L. and Utkin A.V. (2010). *Neo-eneoliticheskiye mogil'niki Verkhnego Povolzhya i Volgo-Okskogo mezhdurechya. Planigraficheskiye i khronologicheskiye struktury*. Moscow: Taus.
- Kriiska, A. (2015). Foreign materials and artefacts in the 4th and 3rd millennia BCE Estonian Comb Ware Complex. In: P. Espak, M. Laanemets and V. Sazoniv, eds., *When gods spoke: researches and reflections on religious phenomena and artefacts. Studia in honorem Tarmo Kulmar*. Studia Orientalia Tartuensia 6. Tartu: University of Tartu Press, pp. 107–124.
- Kristeva, J. (1980). *Pouvoirs de l'horreur*. Paris: Editions du Seuil.
- Kristiansen, K., Allentoft, M.E., Frei, K.M., Iversen, R., Johannsen, N.N., Kroonen, G., et al (2017). Re-theorising mobility and the formation of culture and language among the Corded Ware Culture in Europe. *Antiquity*, 91, pp. 334–347.
- Kukkonen, I.T., Miettinen, M., Julkunen, A. and Mattson, A. (1997). Magnetic prospecting of Stone Age red ochre graves with a case study from Laukaa, central Finland. *Fennoscandia Archaeologica*, XIV, pp. 3–22.
- Lahelma, A. (2005). Between the Worlds: Rock Art, Landscape and Shamanism in Subneolithic Finland. *Norwegian Archaeological Review*, 38 (1), pp. 29–47.
- Lahelma, A. (2006). Excavating Art: a “Ritual Deposit” Associated with the Rock Painting of Valkeisaari, Eastern Finland. *Fennoscandia Archaeologica*, XXIII, pp. 2–23.
- Lahelma, A. (2007). ‘On the Back of a Blue Elk’. Recent Ethnohistorical Sources and ‘Ambiguous’ Stone Age Rock Art at Pyhänpää, Central Finland. *Norwegian Archaeological Review*, 40 (2), pp. 113–137.
- Lahelma, A. (2008). *A Touch of Red. Archaeological and Ethnographic Approaches to Interpreting Finnish Rock Paintings*. Iskos 15. Helsinki: The Finnish Antiquarian Society.
- Lahti, E.-K. (2003). Osteological analysis of cremated bones in grave D (1971) and teeth in graves 13, 14 and 16 (1999). Appendix in Katiskoski 2003, pp. 122–4.
- Lappalainen, M. (2007). Punamullan pauloissa. Kivikauden hautatutkimuksen tutkimushistoria Suomessa. *Muinaistutkija* 3/2007, pp. 2–19.

- Larsson, L. (1988). Döds hus, djurkäkar och stenyxor. Några reflektioner kring senmesolitiskt gravskick. In: K. Jennbert, E. Iregren and L. Larsson, eds., *Gravskick och gravdata*. University of Lund, Institute of Archaeology, Report Series, no. 32. Lund: Arkeologiska Institutionen, Lunds Universitet, pp. 63–72.
- Larsson, L. (1989). Big dog and poor man. Mortuary practices in Mesolithic societies in southern Sweden. In: T.B. Larsson and H. Lundmark, eds., *Approaches to Swedish Prehistory: a Spectrum of Problems and Perspectives in Contemporary Research*. BAR International Series 500. Oxford: Archaeopress, pp. 211–23.
- Larsson, L. (1990). The Mesolithic of Southern Sweden. *Journal of World Prehistory*, 4(3), pp. 257–309.
- Larsson, L. (2017). The past in the past in the mortuary practice of hunter-gatherers: An example from a settlement and cemetery site in northern Latvia. *Documenta Praehistorica*, 44, pp. 338–345.
- Larsson, L. and Zagorska, I. (2006). *Back to the Origin: New Research in the Mesolithic–Neolithic Zvejnieki Cemetery and Environment, Northern Latvia*. Acta Archaeologica Lundensia, Series in 8:o, 52. Stockholm: Almqvist & Wiksell International.
- Larsson, L., Nilsson Stutz, L., Zagorska, I., Bērziņš, V. and Ceriņa, A. (2017). New aspects on the Mesolithic–Neolithic cemeteries and settlement at Zvejnieki, northern Latvia. *Acta Archaeologica* 88 (1), pp. 57–93.
- Larsson, Å.M. (2009). *Breaking and Making bodies and pots. Material and ritual Practices in Sweden in the Third Millenium BC*. Aun 40. Uppsala: Uppsala Universitet.
- Lehtosalo-Hilander, P.-L. (1973). Ruumishautakaivaukset. In: P. Purhonen and L. Söyrinki, eds., *Arkeologin kenttätöitä*. Lahti: Gaudeamus, pp. 141–70.
- Leskinen, S. and Pesonen P. (2008). *Vantaan esihistoria*. Keuruu: Vantaan kaupunki.
- Lõhmus, M. (2007). Mortuary practices during the Comb Ware cultures in Estonia and the problems of their interpretation. In: A. Merkevičius, ed., *Colours of archaeology. Material Culture and the Society. Papers from the Second Theoretical Seminar of the Baltic Archaeologists (BASE) held at the University of Vilnius, Lithuania, October 21–22 2005*. Interarchaeologica 2. Tartu: Tartu Ülikool, pp. 33–48.
- Lõugas, L., Kriiska, A. and Maldre, R. (2007). New dates for the Late Neolithic Corded Ware Culture burials and early husbandry in the East Baltic region. *Archaeofauna*, 16, 21–31.
- Loze, I. (2006). Crouched burials of the Corded Ware Culture in the East Baltic. In: L. Larsson and I. Zagorska, eds., *Back to the Origin. New research in the Mesolithic–Neolithic Zvejnieki cemetery and environment, Northern Latvia*. Acta Archaeologica Lundensia, Series in 8:o, 52. Stockholm: Almqvist and Wiksell International, pp. 331–326.
- Luhov, V. (1961). Kokemäen Pispan kivilautinen asuinpaikka. *Suomen museo*, LXVIII, pp. 5–31.
- Luhov, V. (1965). Esihistoria. *Helsingin pitäjän historia* I. Helsinki: Helsingin maalaiskunnan julkaisu, pp. 7–92.
- Malmer, M.P. (1962). *Jungneolithische Studien*. Acta Archaeologica Lundensia Series in 8, nr 2. Lund: Gleerup.
- Mannermaa, K. (2013). Powerful birds. The Eurasian jay (*Garrulus glandarius*) and the osprey (*Pandion haliaetus*) in hunter-gatherer burials

- at Zvejnieki, northern Latvia and Yuzhniy Oleniy Ostrov, northwestern Russia. *Anthropozoologica*, 48(2), pp. 189–205
- Meiklejohn, C. (2017). Graves, burials and bones: a memoir on documenting human remains in the European Mesolithic. In: M. Sørensen and K. Buck Pedersen, eds., *Problems in Palaeolithic and Mesolithic research*. Copenhagen: University of Copenhagen, pp. 87–103.
- Miettinen, M. (1992a). Laukaan Hartikan kivistä kalmisto. *Keski-Suomi*, 19, pp. 8–23.
- Miettinen, M. (1992b). The Stone Age cemetery of Hartikka in Laukaa, central Finland. In V. Lang and J. Selirand, eds., *Cultural Heritage of the Finno-Ugrians and Slavs: Papers Presented by the Participants in the Soviet-Finnish Archaeological Symposium 10–16 May 1990 in Tallinn*. Tallinn: Estonian Academy of Science, Institute of History, pp. 24–40.
- Mökkönen, T. (2013). Stone setting filled with red ochre from the Keelahaarju site, northernmost Baltic Sea region: a Stone Age grave in the context of north European burial traditions. *Fennoscandia Archaeologica*, XXX, pp. 13–36.
- Nilsson Stutz, L. (2003). *Embodied Rituals & Ritualized Bodies. Tracing Ritual Practices in Late Mesolithic Burials*. Acta Archaeologica Lundensia, 46. Stockholm: Almqvist & Wiksell International.
- Nilsson Stutz, L. (2004). Minnet och glömskan av det döda i Skateholm. In: Å. Berggren, S. Arvidson, and A-M. Hållans, A-M., eds., *Minne och myt. Konst att skapa det förflutna. Vågar till Midgård 5*. Lund: Nordic Academic Press, pp. 81–98.
- Nilsson Stutz, L. (2006). Unwrapping the Dead. In: L. Larsson and I. Zagorska, eds., *Back to the Origin. New research in the Mesolithic-Neolithic Zvejnieki cemetery and environment, Northern Latvia*. Acta Archaeologica Lundensia, Series in 8:o, 52. Stockholm: Almqvist & Wiksell International, pp. 217–233.
- Nilsson Stutz, L. (2010a). The way we bury our dead. Reflections on mortuary ritual, community and identity at the time of the Mesolithic-Neolithic transition. *Documenta Praehistorica*, XXXVII, pp. 33–42.
- Nilsson Stutz, L. (2010b). A Baltic Way of Death? A Tentative Exploration of Identity in Mesolithic Cemetery Practices. In: Å.M. Larsson and L. Papmehl-Dufay, eds., *Uniting Sea II. Stone Age Societies in the Baltic Region*. Occasional Papers in Archaeology, 51. Uppsala. Uppsala University, pp. 127–144.
- Nilsson Stutz, L. (2014). Mortuary Practices. In: V. Cummings, P. Jordan and M. Zvelebil, eds., *The Oxford Handbook of the Archaeology and Anthropology of Hunter-Gatherers*. Oxford: Oxford University Press, pp. 712–728.
- Nilsson Stutz, L., Larsson, L. and Zagorska, I. (2013). The persistent presence of the dead: recent excavations at the hunter-gatherer cemetery at Zvejnieki (Latvia). *Antiquity*, 87, pp. 1016–1029.
- Nordqvist, K. (2016). From Separation to Interaction: Corded Ware in the Eastern Gulf of Finland. *Acta Archaeologica*, 87(1), pp. 49–84.
- Nordqvist, K. and Häkälä, P. (2014). Distribution of Corded Ware in the areas north of the Gulf of Finland – An update. *Estonian Journal of Archaeology*, 18, pp. 3–29.
- Nordqvist, K. & Mökkönen, T. (2017). Periodisation of the Neolithic and radiocarbon chronology of the Early Neolithic and the beginning of the Middle Neolithic in Finland. *Documenta Praehistorica*, XLIV, pp. 78–86.

- Núñez, M. (1995). Cannibalism on Pitted ware Åland? *Karhunhammas*, 16, pp. 61–68.
- Núñez, M. (2015). Dread of the dead – living in the Vicinity of dead Relatives in Finland 1751-1850. In: R. Peyroteo Stjerna and K. von Hackwitz, eds., *Ancient Death Ways. Proceedings of the workshop on archaeology and mortuary practices, Uppsala, May 2013*. Occasional Papers in Archaeology, 59. Uppsala: Uppsala University, pp. 85–104.
- Núñez, M. & Okkonen, J. (1999). Environmental Background for the Rise and Fall of Villages and Megastructures in North Ostrobothnia 4000-2000 cal BC. In: M. Huurre, ed., *Dig it all. Papers dedicated to Ari Siiriäinen*. Helsinki: The Finnish Antiquarian Society and The Archaeological Society of Finland, pp. 105–115.
- Oestigaard, T. (2011). Water. In: T. Insoll, ed., *The Oxford Handbook of the Archaeology of Ritual and Religion*. Oxford: Oxford University Press, pp. 38–50.
- Olivier, L. (2011). *The Dark Abyss of Time: Archaeology and Memory*. Translated by A. Greenspan. Lanham & New York: Altamira Press.
- O’Shea, J. and Zvelebil, M. (1984). Oleneostrovski Mogilnik: Reconstructing the Social and Economic Organization of Prehistoric Foragers in Northern Russia. *Journal of Anthropological Archaeology*, 3, pp. 1–40.
- Oshibkina, S.V. (1989). The material culture of the Veretye-type sites in the region to the east of the Lake Onega. In: C. Bonsall, ed., *The Mesolithic in Europe: Papers Presented at the Third International Symposium, Edinburgh 1985*. Edinburgh: John Donald Publishers, pp. 402–13.
- Parker Pearson, M. (1982). Mortuary Practices, Society and Ideology: An Ethnoarchaeological Study. In: I. Hodder, ed., *Symbolic and Structural Archaeology*. Cambridge: Cambridge University Press, pp. 99–114.
- Parker Pearson, M. (1999). *The Archaeology of Death and Burial*. Thrupp: Sutton Publishing
- Pentikäinen, J. (1990). *Suomalaisen lähtö. Kirjoituksia pohjoisesta kuolemankulttuurista*. Helsinki: Finnish Literature Society.
- Pesonen, P., Hertell, E., Simponen, L., Mannermaa, K., Manninen, M.A., Rostedt, T., Taipale, N. & Tallavaara, M. (2014). Postglacial pioneer settlement in the Lake Sarvinki area, eastern Finland. In: F. Riede and M. Tallavaara, eds., *Lateglacial and Postglacial Pioneers in Northern Europe*. BAR International Series 2599. Oxford: Archaeopress, pp. 177–192.
- Pettitt, P. (2011). *The Palaeolithic Origins of Human Burial*. London and New York: Routledge
- Peyroteo Stjerna, R. (2015). Death in Place: Rituals in Practice. In: R. Peyroteo Stjerna and K. von Hackwitz, eds, *Ancient Death Ways. Proceedings of the workshop on archaeology and mortuary practices, Uppsala, May 2013*. Occasional Papers in Archaeology 59. Uppsala: Uppsala University, pp. 105–126.
- Piezonka, H., Kostyleva, E., Zhilin, M.G., Dobrovolskaya, M. and Terberger, T. (2013). Flesh or Fish? First results of archaeometric research of prehistoric burials from Saktyshe Ila, Upper Volga region, Russia. *Documenta Praehistorica*, XL, pp. 57–73.
- Price, N. 2011. Shamanism. In: T. Insoll, ed., *The Oxford Handbook of the Archaeology of Ritual and Religion*. Oxford: Oxford University Press, pp. 983–1003.

- Purhonen, P. (1980). Jönsaksen punamultahaudat – vanhimmat Suomesta tunnetut hautaukset? In: J. Hako, ed., *Helsingin pitäjä 1980*. Vantaa: Vantaa-Seura – Vandasällskapet ry, pp. 7–15.
- Purhonen, P. (1986). Vantaan Jönsaksen nuorakeraamiset haudat. *Iskos* 6, pp. 113–125.
- Purhonen, P. 1998. *Kristinuskon saapumisesta Suomeen: uskontoarkeologien tutkimus*. Suomen muinaismuistoyhdistyksen aikakausikirja, 106. Helsinki: Suomen muinaismuistoyhdistys.
- Purhonen, P. and Ruonavaara, L. (1994). On subsistence economy at the pre-historic dwelling-site area of Jönsas in Vantaa, Southern Finland. In: P. Purhonen, ed., *Fenno-Ugri and Slavi 1992. Prehistoric economy and means of livelihood*. Museoviraston arkeologisen osaston julkaisuja 5. Helsinki: National Board of Antiquities, pp. 88–97.
- Rainio, R., Lahelma, A., Äikäs, T., Lassfolk, K., Okkonen, J. (2017). Acoustic Measurements and Digital Image Processing Suggest a Link Between Sound Rituals and Sacred Sites in Northern Finland. *Journal of Archaeological Method and Theory*, 25 (2), pp. 453–474|. <http://doi.org/10.1007/s10816-017-9343-1>
- Robb, J. (2013). Creating Death: An Archaeology of Dying. In: S. Tarlow and L. Nilsson Stutz, eds., *The Oxford Handbook of Death and Burial*. Oxford: Oxford University Press, pp. 441–458.
- Räty, J. (1995). The red ochre graves of Vaateranta in Taipalsaari. *Fennoscandia Archaeologica*, XII, pp. 161–72.
- Saag, L., Varul, L., Scheib, C.L., Stenderup, J., Allentoft, M.E., Saag, L., Pagani, L., Reidla, M., Tambets, K., Metspalu, E., Kriiska, A., Willerslev, E., Kivisild, T. and Metspalu, M. (2017). Extensive farming in Estonia started through a sex-biased migration from the steppe. *Current Biology*, 27 (14), pp. 2185–2193. <http://doi.org/10.1016/j.cub.2017.06.022>
- Sayer, D. (2010). *Ethics and burial archaeology (duckworth debates in archaeology)*. London: Duckworth Publishers
- Scarre, G. (2014). ‘Sapient Trouble-Tombs’?: Archaeologists’ Moral Obligations to the Dead. In: S. Tarlow and L. Nilsson Stutz, eds., *The Oxford Handbook of Death and Burial*. Oxford: Oxford University Press, pp. 665–676.
- Scheuer, L. & Black, S. (2000). *Developmental Juvenile Osteology*. Singapore: Elsevier Academic Press.
- Schulz, E.-L. (2006). Joroisten Kanavan radiohiiliajoitukset. In: P. Pesonen and T. Mökkönen, eds., *Arkeologia ja kulttuuri: Uutta kivikauden tutkimuksessa. Arkeologipäivät 2005*. Hamina: Suomen arkeologinen seura, pp. 120–38.
- Siiriäinen, A. (1974). Nuorakeraamisen kulttuurin hauta Teuvalla. *Suomen museo*, 81, pp. 5–14.
- Shanks, M. and Tilley, C. (1982). Ideology, Symbolic Power and Ritual Communication: A Reinterpretation of Neolithic Mortuary Practices. In: I. Hodder, ed., *Symbolic and Structural Archaeology*. Cambridge: Cambridge University Press, pp. 129–154.
- Siikala, A.-L. (2002). *Mythic Images and Shamanism. A Perspective on Kalevala Poetry*. Helsinki: Academia Scientiarum Fennica.
- Sjögren, K.-G., Douglas Price, T. and Kristiansen, K. (2016). Diet and Mobility in the Corded Ware of Central Europe. *PLoS One*, 33(5). <https://doi.org/10.1371/journal.pone.0155083>

- Sørensen, S.A. (2016). Loose human bones from the Danish Mesolithic. In: J. Grünberg, B. Gramsch, L. Larsson, J. Orschiedt and H. Meller, H., eds, *Mesolithic burials - Rites, symbols and social organisation of early postglacial communities 18–21. International Conference Halle (Saale), Germany, 18th–21st September 2013*. Tagungen des Landesmuseums für Vorgeschichte Halle 13/I 2016. Halle (Saale): Landesamt für Denkmalflege und Archäologie Sachsen-Anhalt, pp. 63–72.
- Stout, A. (2013). Cultural History, Race, and Peoples. In: S. Tarlow and L. Nilsson Stutz, eds., *The Oxford Handbook of Death and Burial*. Oxford: Oxford University Press, pp. 17–26.
- Strassburg, J. (2000). *Shamanistic Shadows: one Hundred Generations of undead Subversion in Southern Scandinavia 7000-4000 BC*. Volume 20 of Acta Universitatis Stockholmiensis: Stockholm studies in archaeology 20. Stockholm: Stockholm University.
- Swain, H. (2012). Archive Archaeology. In: R. Skeates, C. McDavid and J. Carman, eds., *The Oxford Handbook of Public Archaeology*. Oxford: Oxford University Press, pp. 351–372.
- Tarlow, S & Nilsson Stutz, L. (2013). Beautiful Things and Bones of Desire: Emerging Issues in the Archaeology of Death and Burial. In: S. Tarlow and L. Nilsson Stutz, eds., *The Oxford Handbook of Death and Burial*. Oxford: Oxford University Press, pp. 1–16.
- Tilley, C. (1994). *A Phenomenology of Landscape. Places, paths and monuments*. Oxford: Berg
- Tõrv, M. (2015): Body on paper. Applying Archaeothanatological Principles in re-analyzing the Tamula XXII Neolithic burial of Estonia. In: R. Peyroteo Stjerna and K. von Hackwitz, eds, *Ancient Death Ways. Proceedings of the workshop on archaeology and mortuary practices, Uppsala, May 2013*. Occasional Papers in Archaeology 59. Uppsala: Uppsala University, pp. 167–190.
- Tõrv, M. (2016). *Persistent Practices: Multi-disciplinary Study of Hunter-gatherer Mortuary Remains from c. 6500–2600 cal. BC, Estonia*. Dissertationes Archaeologiae Universitatis Tartuensis 5. Tartu: Tartu University Press.
- Torvinen, M. (1979). Liedon Kukkarkosken kivikautinen kalmisto. *Suomen museo*, 82, pp. 37–80.
- Trigger, B.G. (2006). *A History of Archaeological Thought*. 2nd edition. Cambridge: Cambridge University Press.
- Turner, V. (1967). *The Forest of Symbols: Aspects of Ndembu Ritual*. Ithaca, N.Y.: Cornell University Press.
- Turek, J. (2014). Houses of living and houses of dead in the Neolithic and Copper Age of Central Europe, *Préhistoires Méditerranéennes*, [Online], *Colloque* |2014. Available at: <http://pm.revues.org/1132> [Accessed 10 March 2016].
- Ukkonen, P. (2001). *Shaped by the Ice Age. Reconstructing the history of mammals in Finland during the Late Pleistocene and Early Holocene*. Helsinki: University Printing House.
- Vajanto, K. (2013). Fibre analysis of Late Iron Age, Early Medieval and modern Finnish wools. *Fennoscandia archaeologica*, XXX, pp. 81–94
- Vander Linden, M. (2007). For equalities are plural: Reassessing the social in Europe during third Millenium BC. *World Archaeology*, 39(2), pp. 177–193.
- Van Dyke, R. and Alcock, S. (eds.) (2003). *Archaeologies of Memory*. Melbourne: Blackwell Publishing

- van Gennep, A. (1960 [1909]). *The Rites of Passage*. Chicago: Chicago University Press.
- Waronen, M. (1898). *Vainajainpalvelus muinaisilla suomalaisilla*. Helsinki: Suomalaisen kirjallisuuden seuran kirjapainon osakeyhtiö.
- Varul, L., Galeev, R.M., Malytina, A.A., Tõrv, M., Vasilyev, S.V., Lõugas, L. and Kriiska, A. (2019). Complex mortuary treatment of a Corded Ware Culture individual from the Eastern Baltic: A case study of a secondary deposit in Sope, Estonia. *Journal of Archaeological Science: Reports*, 24, pp. 463–472.
- Weiner, S. (2010). *Microarchaeology. Beyond the Visible Archaeological Record*. Cambridge & New York: Cambridge University Press.
- Wessman, A. (2010). *Death, Destruction and Commemoration. Tracing ritual activities in Finnish Late Iron Age cemeteries (AD 550-1150)*. Iskos 18. Helsinki: The Finnish Antiquarian Society
- Westerdahl, T. (2015). Contrasts of the maritime environment – possible implications in prehistory – A very short course of cognition in the ancient maritime cultural landscape. In: H. Steberg Løkken, R. Berge, E. Lindgaard and H. Vangen Stuedal, eds., *Ritual landscape and borders within rock art research. Papers in honour of professor Kalle Sognnes*. Oxford: Archaeopress, pp. 141–154.
- Wickholm, A. (2006). “Stay where You Have Been Put!” The Use of Spears as Coffin Nails in Late Iron Age Finland. In: H. Valk, H., ed., *Ethnicity and Culture. Studies in Honour of Silvia Laul*. Muinasaja Teadus 18. Tartu and Tallinn: Tartu Ülikooli arheoloogia õppetool, pp. 193–207.
- Wickholm, A. (2008). Re-use in the Finnish Cremation Cemeteries under Level Ground – Examples of Collective Memory. In: F. Fahlander and T. Oestigaard, eds., *Materiality of Death – Bodies, Burials, Beliefs*. BAR International Series 1768. Oxford: Archaeopress, pp. 89–97.
- Viljanmaa, S. (2008). Punamultahauta Yli-Iin Kierikinkankaan kivikautiselta asuinpaikalta. In: J. Ikäheimo and S. Lipponen, eds., *Ei kiveäkään kääntämättä: juhla kirja Pentti Koivuselle*. Oulu: Pentti Koivusen juhla kirjatoimikunta, pp. 175–82.
- Williams, H. (1997). Ancient Landscapes of the Dead: The Reuse of Prehistoric and Roman Monuments as Early Anglo-Saxon Burial Sites. *Medieval Archaeology: Journal of the society for medieval archaeology*, 41, pp. 1–32.
- Williams, H. (2013). Death, Memory and Material Culture. Catalytic Commemoration and the Cremated Dead. In: S. Tarlow and L. Nilsson Stutz, eds., *The Oxford Handbook of Archaeology of Death and Burial*. Oxford: Oxford University Press, pp. 195–208.
- Willerslev, R., Vitebsky, P., Alekseyev, A. (2014). Sacrifice as the ideal hunt: a cosmological explanation for the origin of reindeer domestication. *Journal of the Royal Anthropological Institute*, 21, pp. 1–23.
- Vikkula, A. (1987). The Stone Age graves of Nästinristi site in Laitila, SW Finland. *Suomen Museo*, 93, pp. 5–17.
- Włodarczak, P. (2008). Corded Ware and Baden cultures. Outline of chronological and genetic relations based on the finds from western little Poland. In: M. Furholt, M. Szmyt and A. Zastawny, eds., *The Baden Complex and the Outside World. Proceedings of the 12th Annual Meeting of the EAA in Cracow 19-24th September 2006*. Studien zur Archäologie in Ostmitteleuropa, Band 4. Bonn: Dr. Rudolph Habelt GmbH, pp. 247–261.
- Zagorska, I. (2001). Amber Graves of Zvejnieki Burial Ground. In: A. Butrimas, ed., *Baltic Amber. Proceedings of the international interdisciplinary*

- conference *Baltic Amber in natural sciences, archaeology and applied arts 13 – 18 September, Vilnis, Palanga, Nida*. Acta Academiae Artium Vilnensis 21. Vilnius: Vilnius Academy of Fine Arts Press, pp. 109–124.
- Zagorska, I. (2006). Radiocarbon chronology of the Zvejnieki burials. In: L. Larsson and I. Zagorska, eds., *Back to the Origin. New research in the Mesolithic-Neolithic Zvejnieki cemetery and environment, Northern Latvia*. Acta Archaeologica Lundensia, Series in 8:o, 52. Stockholm: Almqvist & Wiksell International, pp. 91–113.
- Zagorska, I. (2017). *Senā Burtnieka Noslēpumi. Secrets of Ancient Lake Burtnieks*. Riga: Zinātne.
- Zagorskis, F. 2004 [1987]. *Zvejnieki (Northern Latvia) Stone Age Cemetery*. Translated by V. Bērziņš. BAR International Series 1292. Oxford: Archaeopress.
- Zarina, G. (2006). Paleodemography of the Stone Age burials at Zvejnieki. In: L. Larsson and I. Zagorska, eds., *Back to the Origin. New research in the Mesolithic-Neolithic Zvejnieki cemetery and environment, Northern Latvia*. Acta Archaeologica Lundensia, Series in 8:o, 52. Stockholm: Almqvist & Wiksell International, 133–148.
- Zerubavel, E. (2003). *Time Maps: Collective Memory and the Social Shape of the Past*. Chicago: University of Chicago Press.
- Zvelebil, M. (2003). Enculturation of Mesolithic Landscapes. In: L. Larsson, H. Kindgren, K. Knutsson, D. Loeffler and A. Åkerlund, eds., *Mesolithic on the Move. Papers presented at the Sixth International Conference on the Mesolithic in Europe, Stockholm 2000*. Oxford: Oxbow books, pp. 65–73.

APPENDIX I

Appendix 1: List of Finnish Stone Age earth grave sites (2019)

HUNTER-GATHERER BURIAL SITES						
Site	Municipality	Amount of excavated / documented burials	Description	Radiocarbon dating (BP)	Relative dating (artefact typology / adjoining settlement)	Reference
Aisti (<i>cemetery at a settlement site</i>)	Mynämäki	5	Five underground stone cist graves with heavy ochre located at the settlement site associated with the Early Neolithic and Corded Ware periods. A sherd of undetermined ceramics and two stone flakes were discovered in one burial (grave IV), whilst the other graves lacked artefacts.		Neolithic?	Edgren 1966
Alasuvannon leirikeskus (<i>settlement site grave</i>)	Utajärvi	1	A possible partially destroyed grave structure with sooty soil, ochre, and quartz flakes located at a Stone Age settlement site with an undetermined date.		Unknown	Huurre 1955
Bosmalm (<i>settlement site grave</i>)	Espoo	1	A deep grave structure with sooty soil and small amounts of ochre discovered beneath a larger depression at a Middle Neolithic settlement site associated with Typical Comb Ware and Uskela Ware. The grave structure contained two partial ceramic vessels (Typical Comb Ware) and a large, egg-shaped natural stone.		Neolithic (Typical Comb Ware)	Kankkunen 1994
Gröndal 2 (<i>settlement site grave</i>)	Vantaa	1	A partially destroyed grave structure with intensive ochre and several quartz flakes. The structure was discovered within a Mesolithic settlement site.		Mesolithic?	Räty 1972
Haavistonharju I (<i>settlement site grave</i>)	Kuortane	1	A grave structure with intensive ochre excavated at a Mesolithic settlement site. The grave contained several quartz flakes.		Mesolithic?	Luho 1963

Harjukangas B <i>(solitary grave)</i>	Laukaa	1	A partially destroyed possible grave structure with ochre. No grave objects. Located near an Early Neolithic settlement site.	Neolithic?	Finnish Heritage Agency: Cultural environment service portal (www.kyppi.fi)
Hartikka <i>(cemetery)</i>	Laukaa	8	A cemetery with eight excavated burials featuring intensive ochre situated near a Middle Neolithic settlement site associated with Typical Comb Ware. Several graves contained amber and flint artefacts. According to magnetic prospecting conducted during the 1990s, the cemetery may contain additional burials.	Neolithic (Typical Comb Ware)	Miettinen 1990, 1992a–b, Kukkonen et al. 1997
Hiittenharju <i>(settlement site grave)</i>	Harjavalta	1	A partially destroyed grave structure with intensive ochre situated at a Middle Neolithic settlement site associated with Pyheensilta Ware. The grave contained a stone setting and sherds of undetermined ceramics along with a rim sherd of Pyheensilta Ware collected from the grave fill.	Neolithic (Pyheensilta Ware)	Taskinen 1983
Holopainen <i>(settlement site grave?)</i>	Leppävirta	1	At least one grave structure (possibly more) with ochre and flint artefacts located at a Middle Neolithic settlement site associated with Typical Comb Ware.	Neolithic (Typical Comb Ware)	Luho 1966
Hukkalanharju <i>(settlement site graves)</i>	Vieremä	3	Three rectangular-shaped grave structures located at a settlement site associated with Middle Neolithic Typical Comb Ware and asbestos-tempered pottery. The grave structures contained ochre, but no grave objects.	Neolithic?	Pohjakallio 1979
Jokela <i>(settlement site grave)</i>	Kuusamo	1	A grave structure of stained, greasy soil and ochre located at a Mesolithic settlement site. The grave contained no finds, although a row of small stones was placed at the bottom of the pit.	Mesolithic?	Väkeväinen 1979

Jäkärilä <i>(settlement site grave)</i>	Turku	1	A possible grave structure with ochre located at a Middle Neolithic settlement site associated with Typical Comb Ware and Uskela Ware. A flint projectile point was discovered next to the grave.		Neolithic (Typical Comb Ware)	Europaeus (Äyräpää) 1922
Jönsas <i>(cemetery at a settlement site)</i>	Vantaa	24	A cemetery of 24 graves with heavy ochre and stone settings made from water-polished stones located on a multiperiod settlement site in use during the Late Mesolithic, the Middle Neolithic (CWC) and the Bronze and Early Iron Ages. No grave objects were discovered from the graves.		Unknown	Purhonen 1980; Paper IV
Kalmosärkkä <i>(settlement site grave)</i>	Suomussalmi	1	A grave feature with small amounts of ochre located at a multiperiod settlement site which was in use throughout Finnish prehistory. The grave feature yielded a fragmented amber pendant.		Neolithic?	Huurre 1986
Kanava <i>(settlement site graves)</i>	Joroinen	2	Two graves with amber objects located at a settlement site associated with Middle Neolithic Typical Comb Ware.	(Hela-244) 2210 ± 65 (combined sample of human bone from four individuals)	Neolithic (Typical Comb Ware)	Mustonen 2005, Schultz 2006
Kangas <i>(cemetery at a settlement site?)</i>	Kaustinen	3	Two graves with amber and flint objects located at a settlement site associated with Middle Neolithic Typical Comb Ware. One of the graves was a single burial, whilst the other seems to be a multiple burial of two individuals. The site may contain additional graves.		Neolithic (Typical Comb Ware)	Halinen 1997
Kariaho <i>(cemetery at a settlement site?)</i>	Kiuruvesi	3	Three grave structures with ochre, one of which yielded several slate pendants, one flint projectile point, and one with no grave objects. The graves were located within a Middle Neolithic settlement site associated with Typical Comb Ware. Additional graves might be present at the site.		Neolithic (Typical Comb Ware)	Luho 1961

Kellolaisten tuli II <i>(settlement site grave)</i>	Suomussalmi	1	A rectangular-shaped grave feature with a small amount of yellowish ochre. The grave feature was located within a multiperiod settlement site in use from the Early Neolithic to the Early Metal Period. Alongside the ochre, the grave feature yielded a stone axe and a slate knife.		Neolithic?	Huurre 1986
Kierikkikangas <i>(grave)</i>	Oulu	1	A grave feature with heavy ochre, but no grave objects situated at a settlement site associated with Middle Neolithic Typical Comb Ware.	(Hela-1956) 4780 ± 40 (charcoal beneath the ochre layer)	Neolithic (Typical Comb Ware)	Viljanmaa 2008
Knaapin hiekkakuoppa <i>(cemetery at a settlement site?)</i>	Lieto	3	Three possible grave features with heavy ochre (two features) and no ochre (one feature) located near or within a Mesolithic settlement site. One of the graves yielded a flint flake, whilst the others contained no artefact finds. The site was destroyed by modern land use.		Mesolithic?	Kankkunen 2003
Kolmhaara <i>(cemetery)</i>	Eura	25	A cemetery of six Middle Neolithic earth graves with ochre along with amber and flint objects. Alongside the earth graves, 19 cist graves with ochre, but no grave objects were also excavated from the cemetery. The cemetery is located near a settlement site associated with Early Neolithic and Middle Neolithic Typical Comb Ware.	(Hela-4082) 4992 ± 60 (bark from burial 1); (Hela-244) 2210 ± 65 (human bone from burial XX); (Hela-245) 1505 ± 55 (human bone from burial XXIII); (Hel-38) 5420 ± 150 (charcoal beneath burial XVII)	Earth graves: Neolithic (Typical Comb Ware) Cist graves: Bronze and Iron Ages?	Edgren 1966, Edgren 1999
Komsinkangas <i>(solitary grave)</i>	Teuva	1	A partially destroyed grave structure with ochre-stained soil and several large stone slabs made of reddish sandstone. The grave did contain no grave objects.		Unknown	Torvinen 1984

Kotikangas <i>(settlement site grave)</i>	Evijärvi	1	A partially destroyed grave feature with heavy ochre located at a Middle Neolithic settlement site associated with Typical Comb Ware. Small fragments of amber, flint flakes, and two fragmented bone artefacts were collected as stray finds from the ochre. The items were covered with ochre and were, thus, interpreted as grave objects.		Neolithic (Typical Comb Ware)	Miettinen 2007
Kukkarkoski 1 <i>(cemetery)</i>	Lieto	12	A cemetery of 12 Middle Neolithic hunter-gatherer graves and one Corded Ware grave located near a settlement site associated with Middle Neolithic Typical Comb Ware. Most of the hunter-gatherer graves contained ochre, amber, and flint objects, although some graves yielded no artefact finds.	(Hel-832) 4890 ± 150 (charcoal from the grave structure of burial 1a)	Neolithic (Typical Comb Ware)	Torvinen 1979, Paper I
Laajamaa 1 <i>(settlement site graves?)</i>	Tervola	3	Two grave features and several smaller pits of ochre located at a settlement site associated with Middle Neolithic Typical Comb Ware. One of the graves was likely a single burial, whilst the other was a multiple burial of two individuals. For instance, several amber pearls, slate rings, and a small pottery vessel were collected as grave objects from the features.		Neolithic (Typical Comb Ware)	Engblom 1992
Lappfjärd-Björnäsen <i>(settlement site grave)</i>	Kristiinankaupunki	1	A partially destroyed grave structure with ochre located at a multiperiod settlement site in use from the Early Neolithic to the latter parts of the Middle Neolithic. Several fragments from amber rings and pendants were collected from the ochre associated with the grave.		Neolithic (Typical Comb Ware)	Hiekkanen 1991

Lappfjärd-Rävåsen (<i>settlement site</i> <i>grave</i>)	Kristiinankaupunki	1	A grave structure of stained soil and small amounts of ochre located at a multiperiod settlement site associated with Middle Neolithic Typical Comb Ware, Swedish Pitted Ware, Corded Ware, and Pyheensilta Ware. The grave was furnished with a slate object and two amber rings, one of which was v-perforated.		Neolithic (latter part of the Middle Neolithic)	Laulumaa 1997
Maarinkunnas (<i>settlement site</i> <i>graves</i>)	Vantaa	2	Two oval-shaped grave features of stained soil located at a settlement site primarily associated with Middle Neolithic Typical Comb Ware and Uskela Ware. One grave contained a v-perforated amber button, whilst the other contained a fragmented amber pendant and a clay pearl.		Neolithic (latter part of Middle Neolithic)	Leskinen 1998
Maianiemi Kokkomäki (<i>settlement site</i> <i>graves</i>)	Pihtipudas	3	Three grave features with heavy ochre located within a Stone Age settlement site with an unknown date. Sherds of Pöljä Ware were discovered from the fill of two graves.		Neolithic (Pöljä Ware)	Roine 1966
Majoonsuo (<i>settlement site</i> <i>grave?</i>)	Outokumpu	1	A partly destroyed rectangular-shaped grave feature with heavy ochre located nearby/within a multiperiod settlement site in use from the Neolithic to the Early Metal Period. Alongside the ochre, the grave feature yielded human enamel fragments and ochre-stained quartz flakes.		Neolithic?	Jan-Erik Nyman (personal communication, 23 May 2018 & 15.5.2019)
Marketanhiekka (<i>settlement site</i> <i>graves</i>)	Pieksämäki	2	Two possible grave features with heavy ochre located at a multiperiod settlement site associated with Early Neolithic and Middle Neolithic (Typical Comb Ware and Pöljä Ware). The grave features contained no finds.	(Hela-539) 2195 ± 75 (charcoal from the ochre layer of burial 1)	Neolithic?	Kankkunen & Katiskoski 2004

Nikeli (<i>settlement site grave</i>)	Kotka	1	An oval grave feature with ochre located at a settlement site associated with Middle Neolithic Typical Comb Ware. A retouched flint flake was discovered from the grave.		Neolithic (Typical Comb Ware)	Waris 1961
Nästinristi (<i>cemetery at a settlement site</i>)	Laitila	9	A cemetery with nine graves primarily without ochre. A heavy stone packing covered some of the graves. In addition, the remains of a wooden inner structure were discovered from some of the graves. The cemetery was situated within a Middle Neolithic settlement site associated with Typical Comb Ware and Uskela Ware, and the graves were surrounded by dozens of hearths. Clear grave objects (Uskela Ware pottery vessel and a small stone adze) were discovered only in sporadic graves.	(Hel-1348) 4460 ± 130 (charcoal from burial I); (Hel-1349) 4910 ± 130 (wood charcoal from the grave structure of burial II); (Hel-1350) 4850 ± 130 (wood charcoal from the grave structure of burial II)	Neolithic (Uskela Ware)	Vikkula 1986
Pispa (<i>cemetery at a settlement site</i>)	Kokemäki	22	A cemetery of 22 excavated graves located at Middle a Neolithic settlement site associated with Typical Comb Ware. Most graves contained large amounts of ochre. In addition, a rich find material of amber and flint objects was collected from about ten graves.		Neolithic (Typical Comb Ware)	Luho 1961
Pitkämäki (<i>settlement site grave</i>)	Lapua	1	A possible grave feature of stained soil and small amounts of ochre located at a Middle Neolithic settlement site associated with Typical Comb Ware and Uskela Ware. A fragmented amber pendant was collected near the structure.		Neolithic (Typical Comb Ware?)	Kopisto 1954, Edgren 1966
Pohjoisniemi-Tilkku (<i>settlement site grave</i>)	Pihtipudas	1	A grave structure with heavy ochre situated at a Middle Neolithic settlement site associated with Typical Comb Ware. The grave structure yielded no artefact finds.		Neolithic (Typical Comb Ware?)	Miettinen 1998

Pokronlampi <i>(settlement site grave)</i>	Lieksa	1	A grave structure with heavy ochre situated at a multiperiod settlement site in use from the Neolithic to the Early Metal Period. The grave structure yielded no artefact finds, but was connected to a hearth stained by ochre.		Neolithic?	Katiskoski 1992
Pörrinmökki <i>(settlement site grave)</i>	Rääkkylä	1	A possible grave structure of stained soil discovered within a settlement site associated primarily with Middle Neolithic Typical Comb Ware. The possible grave was situated next to a hearth and a large whetstone was placed in an upward position in the structure. Sherds of Typical Comb Ware pottery were discovered beneath the whetstone.		Neolithic (Typical Comb Ware)	Pesonen 1997
Rahakangas 1 <i>(settlement site grave)</i>	Joensuu	1	A grave structure situated within a multiperiod settlement site dating to the Early Mesolithic, the late Neolithic, and the Early Metal periods. The grave contained ochre and some preserved human remains, but no artefact finds.	(Hela-2379) 7726 ± 58 (charcoal from the grave pit fill)	Mesolithic?	Pesonen et al. 2014
Saha <i>(settlement site grave)</i>	Hyrnsalmi	1	A grave structure of stained soil and heavy ochre situated within a settlement site associated with Early Neolithic and Middle Neolithic Pöljä Ware. A small slate adze and some quartz flakes were discovered in the grave.		Neolithic	Huurre 1986
Sarvisuo <i>(settlement site grave)</i>	Kitee	1	A grave structure with heavy ochre situated within a multiperiod settlement site in use from the Early Neolithic to the Late Neolithic. Finds typical for the settlement site (e.g., shards of pottery, quartz flakes, and burnt animal bones) were collected from the grave fill together with a water-polished cobble. The grave contained no artefacts.	(Hela-166) 3010 ± 80 (charcoal from the grave pit fill)	Neolithic?	Pesonen 1996

Saviniemi <i>(settlement site grave)</i>	Joensuu	1	A grave structure with ochre situated within a Middle Neolithic settlement site associated with Middle Neolithic Typical Comb Ware. A stone axe was found in the grave in an upward position.	Neolithic (Typical Comb Ware)	Edgren 1966
Sopenkangas <i>(settlement site grave)</i>	Sievi	1	A partially destroyed grave structure with ochre located at an Early Neolithic settlement site. The grave contained no artefacts, although some quartz flakes were collected from the grave fill.	Early Neolithic?	Torvinen 1980a
Stenkulla <i>(settlement site grave)</i>	Vantaa	1	A grave structure of stained soil and small amounts of ochre discovered from a settlement site associated with Middle Neolithic Typical Comb Ware. Several flint and amber objects were found in the grave.	Neolithic (Typical Comb Ware)	Leskinen & Pesonen 2008
Säterigatan <i>(settlement site grave)</i>	Raasepori	1	A grave structure of stained soil and some ochre located at a multiperiod settlement site in use from the Early Neolithic to the end of Middle Neolithic. One-half of a Typical Comb Ware pottery vessel was found in shards in the grave. Some of the walls of the grave were also lined with pottery shards.	Neolithic (Typical Comb Ware)	Wickholm 2000
Sätös <i>(settlement site graves)</i>	Outokumpu	4	Four partially destroyed graves situated within a multiperiod settlement site dating from the early Neolithic to the end of Middle Neolithic. Most of the graves contained ochre along with amber, flint, and slate artefacts.	Neolithic (Typical Comb Ware)	Räihälä 1996
TB:n ranta <i>(settlement site grave)</i>	Suomussalmi	1	A grave structure of ochre discovered at a settlement site associated with an undefined Stone Age period and the Early Metal Period. The grave contained no artefact finds.	Unknown	Taskinen 1986

Tainiara (cemetery at a settlement site)	Simo	35	A cemetery of at least 35 excavated graves located at an early Neolithic settlement site. All of the graves were rectangular-shaped and oriented WSE–ENE. The graves did not transect one another. Ochre was only used sparsely on rare occasions. Similarly, grave objects were collected from only a few graves. According to a recent geophysical analysis, the cemetery might yield additional graves.	(Hel-2978) 5410 ± 120 (charcoal from burial 1990); (Hel-2979) 5430 ± 120 (charcoal from burial 1989/1); (Hel-2979) 5430 ± 120 (charcoal from burial 1989/2)	Early Neolithic	Wallenius 1990, 1991, 1992; Halinen 1999; Hakonen 2019
Timonen 1 (settlement site grave)	Evijärvi	1	A grave structure of stained soil and small amounts of ochre discovered from a settlement site associated with Middle Neolithic Typical Comb Ware and Uskela Ware. A single v-perforated amber button was found in the grave.		Neolithic (latter part of the Middle Neolithic)	Miettinen 2006
Vaateranta (cemetery at a settlement site)	Taipalsaari	22	A cemetery of about 20 graves situated within a multiperiod settlement site dating to the early Neolithic, the Middle Neolithic (Typical Comb Ware), and the early Metal Period. Most graves consisted of inhumations with ochre and find material, primarily typical for the Middle Neolithic (Typical Comb Ware) period. In addition, one cremation burial was excavated from the site.	(Ua-3326) 5775 ± 100 (charcoal from cremation burial D); (Hela-739) 5045 ± 45 (human bones from cremation burial D); (Hela-317) 5010 ± 75 (resin from pottery in burial 3); (Hela-315) 4895 ± 70 (resin from pottery in burial 4); (Hela-318) 4835 ± 80 (resin from pottery in burial 9a); (Hela-319) 4315 ± 80 (resin from pottery in burial 9b); (Hela-237) 3460 ± 70 (charcoal from the ochre layer of burial 1)	Neolithic (Typical Comb Ware)	Räty 1995, Katiskoski 2003

Vihi 1 (settlement site grave)	Rääkkylä	1	A rectangular-shaped grave feature with ochre situated within a multiperiod settlement site dating from the Early Neolithic to the end of the Middle Neolithic. An amber pendant was found in the grave.	Neolithic (Typical Comb Ware)	Pesonen 1998
Vilkajärvi (settlement site grave)	Sulkava	1	A grave structure of stained soil and small amounts of ochre discovered at a settlement site associated with Middle Neolithic Typical Comb Ware. The grave was furnished with a stone axe and a stone adze placed as a part of a stone structure made from natural stones. The stone structure was discovered along the bottom layer of the grave and followed the alignment of the structure.	Neolithic (Typical Comb Ware)	Karjalainen 1992
Äkälänniemi (settlement site grave)	Kajaani	1	A partially documented grave structure of heavy ochre discovered at a settlement site associated with the Mesolithic period. Several quartz flakes and some quartz artefacts were concentrated along the bottom of the grave.	Mesolithic?	Schultz 1999

CORDED WARE BURIAL SITES

Site	Municipality	Amount of excavated / documented burials	Description	Radiocarbon dating (BP)	Relative dating (artefact typology)	Reference
Aimalankangas <i>(solitary grave)</i>	Lempäälä	1	A partially destroyed grave structure possibly surrounded by a circle of stones. A battle axe, an adze, and sherds of Corded Ware pottery were found within the stone structure.		Neolithic (Corded Ware)	Voionmaa 1935
Dalamalm <i>(settlement site grave?)</i>	Siuntio	1	A partially destroyed grave structure of stained soil located near a Corded Ware settlement site. The grave contained several natural stones, one of which was triangular-shaped. In addition, a so-called East-Karelian even-bladed adze and several shards of Corded Ware pottery were found in the grave structure.		Neolithic (Corded Ware)	Edgren 1970
Forsberg <i>(solitary grave)</i>	Porvoo	1	A partially destroyed oval-shaped grave structure of sooty soil that possibly contained a wooden cist. The grave was richly equipped with three Corded Ware beakers and shards from several other vessels. In addition, rim shards from household pottery were also used as grave objects.	(GrN-6250) 4105 ± 55 (wood charcoal from the grave structure)	Neolithic (Corded Ware)	Edgren 1958, 1970
Itko <i>(settlement site grave?)</i>	Valkeakoski	1	A possible grave structure completely destroyed before documentation. The grave was possibly covered with stone packing, and a battle axe was discovered as a stray find amongst the stones. A dark, sooty feature was noted underneath the stone setting.		Neolithic (Corded Ware)	Hukkinen 1951
Jyrkänkallio <i>(settlement site grave?)</i>	Lieto	1	A possible grave structure located at an unexcavated site potentially representing a Corded Ware settlement site. The grave was completely destroyed before documentation, and a Corded Ware vessel (in shards), a four-sided axe, and a small adze were found at the location. The finds were possibly surrounded by small stones and covered by a larger stone.		Neolithic (Corded Ware)	Leppäaho 1936

Jönsas (<i>graves at a hunter-gatherer cemetery</i>)	Vantaa	5	Five grave structures situated within a hunter-gatherer cemetery. Approximately half of the structures were rectangular-shaped and half oval-shaped. Corded Ware pottery vessels were found in all of the grave structures. In addition, two adzes were collected from one grave.	(Hel-1006) 4520 ± 130 (wood charcoal from the fill of burial IV)	Neolithic (Corded Ware)	Purhonen 1986, Paper IV
Kehioja (<i>solitary grave at an old hunter-gatherer site</i>)	Paimio	1	A partially destroyed grave structure of char, sooty soil situated within a settlement site associated with Early Neolithic hunter-gatherers. The grave structure was rectangular-shaped and plausibly contained a battle axe and a half of a Corded Ware vessel (the items were collected as stray finds from the site prior to excavation). The grave might have been covered by a small mound.		Neolithic (Corded Ware)	Kivikoski 1934
Kiparkatti (<i>solitary grave</i>)	Myrskylä	1	A partially destroyed solitary grave structure of sooty soil. The structure was documented, but not excavated. A battle axe was collected at the site prior to documentation, and during documentation a quartz core and some quartz flakes were collected from the structure.		Neolithic (Corded Ware)	Edgren 1999
Koivula (<i>solitary grave</i>)	Akaa	1	Partially destroyed solitary grave structure with charcoal and reddish, burnt soil. A battle axe was collected as a stray find from the location prior to excavation, and two quartz flakes were found in the grave fill.		Neolithic (Corded Ware)	Äyräpää & Hukkinen 1949
Kortesnevantorpi (<i>solitary grave</i>)	Teuva	1	A partially destroyed grave structure in which the walls and the floor of the grave were covered with dark, sooty soil. A Corded Ware vessel was found in the grave.		Neolithic (Corded Ware)	Siiriäinen 1974

Kukkarkoski <i>(grave at a hunter-gatherer cemetery)</i>	Lieto	1	A rectangular-shaped grave structure of sooty soil and fragments of charred wood located within a Middle Neolithic cemetery associated with Typical Comb Ware. A Corded Ware vessel was found at the grave.	(Hela-4083) 4181 ± 60 (wood charcoal from the grave structure); (Hel-831) 4320 ± 150 (wood charcoal from the grave structure)	Neolithic (Corded Ware)	Torvinen 1979, Paper I
Kuoppakangas <i>(solitary grave)</i>	Merijoki	1	A possible grave structure covered by a stone setting completely destroyed by modern land use. Two battle axes (possibly locally produced) were collected beneath the stones.		Neolithic (Corded Ware)	Äyräpää 1932
Perttulanmäki <i>(solitary grave)</i>	Kauhava	1	A partially destroyed rectangular-shaped grave feature of stained soil. Two adzes, a stone chisel, and a Corded Ware vessel in shards were found in the grave along with a fragment of a human molar. According to recent microarchaeological analysis, a goat skin was placed in the grave. The grave might also have contained a wooden chamber.		Neolithic (Corded Ware)	Äyräpää 1931, Paper III
Piirtolankangas <i>(solitary grave)</i>	Ilmajoki	1	Shards of Corded Ware pottery, fragments from a stone chisel, a battle axe, and an adze were collected as stray finds from an oval-shaped feature of sooty soil.		Neolithic (Corded Ware)	Hackman 1913
Tiilipirtti <i>(solitary grave)</i>	Lahti	1	A partially destroyed grave structure for which only a profile was documented. The grave was oval-shaped, and the walls and the floor of the pit were framed by small fragments of wood charcoal. A battle axe was collected as a stray find from the location.		Neolithic (Corded Ware)	Salmo 1958
Tuomala <i>(solitary grave)</i>	Mynämäki	1	A partially destroyed grave structure of stained, greasy soil and a stone setting. A battle axe was collected from the location as a stray find prior to excavation.		Neolithic (Corded Ware)	Meinander 1938
Uusi-Jaara <i>(solitary grave at an old hunter-</i>	Sastamala	1	Sherds from a Corded Ware pottery vessel and a battle axe as stray finds from a depth of about 50–100 cm		Neolithic (Corded Ware)	Europaeus (Äyräpää) 1927

*gatherer
settlement site)*

with black soil and pieces of
charcoal.
